



DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur		Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Airbus Helicopters		Model / Modèle AS355		Registration / Immatriculation All eligible	
				Serial No. / N° du série All eligible	
				Part No. / N° de la pièce	
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)				<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)				<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type				<input checked="" type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée.	
<input checked="" type="checkbox"/> Revision No. SH16-29 Révision N°				<input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère	
				Identify Identifier EASA - new STC	
<input type="checkbox"/> Restricted Category Type of Operation Catégorie restreinte Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails.					
Installation of quick release bicycle rack on mounting provisions installed in accordance with STC SH08-16.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H-87 (R.146)		Issue No. / N° de l'édition 10 (6)		Identify State of Design / Identifier l'état de conception EASA	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification				<input checked="" type="checkbox"/>	
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)				<input checked="" type="checkbox"/>	
Applicant's remarks / Remarques du demandeur Application to EASA for a new STC. Identical to EASA STC 10060495.					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
JEFF CLARKE Name and Signature of Applicant / Nom et signature du demandeur		VICE PRESIDENT Title / Poste		2018-12-03 Date (yyyy-mm-dd) / Date (aaaa-mm-jj)	



Application for Approval of Supplemental Type Certificate

Data protection: Personal data included in this application is processed by EASA pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. It will be processed solely for the purposes of the performance, management and follow-up of the Application by the Agency, without prejudice to possible transmission to internal audit services, to the Court of Auditors, to the European Anti-Fraud Office (OLAF) for the purposes of safeguarding the financial interests of the European Union. The Applicant shall have the right of access to his personal data and the right to rectify any such data that is inaccurate or incomplete. Should the Applicant have any queries concerning the processing of his personal data, he shall address them to the Agency at the following address: dpo [at] easa.europa.eu. The Applicant shall have right of recourse at any time to the European Data Protection Supervisor.

1. Applicant's Reference

1.1 Your Reference

1002

2. Applicant Address and Contact Data

2.1 Applicant Data

2.1.1 Name and Address (registered (business) name and address/legal seat of the company)

Applicant Number **300116**

(A)DOA Reference

(Company) Name Aero Design Ltd.

Street / Nr 9888A Malaspina Road

Post Code V8A 0G3

City Powell River, BC

Country Canada

2.1.2 Contact Person (responsible for this application)

Title ☒ Mr ☐ Ms

Name Clarke

First name Jeff

Job title Engineering Technologist

Phone/Fax Phone: 604-483-2376 Fax: 604-483-2372

Email jeff@aerodesign.ca

Important Note: First time applicants need to submit a copy of the company's **Business Registration** or similar legal document stating name and seat of the company together with the application. In case the applicant is not a company but a natural person, a copy of the person's **ID or passport** needs to be provided with the first application.

2.2 Billing Data (may be left blank, if same as 2.1 Applicant Data)

2.2.1 Billing Address (For the receipt of EASA Fees and Charges Invoices. EASA invoices are issued via post-mail to the address provided here.)

(Company) Name Same as in section 2.1.1 (other name only in exceptional cases)

Street / Nr

PO Box

Post Code

City

Country

2.2.2 Contact Person (Responsible for ensuring the EASA terms of payment are honoured. An electronic invoice copy will be issued to the email address indicated here.)

Title ☐ Mr ☒ Ms

Name Rekve

First name Wanda

Job title Office Manager

Phone/Fax Phone: 604-483-2376 Fax: 604-483-2372

Email wanda@aerodesign.ca

**Application for Approval of Supplemental Type Certificate****2.3 Shipping Data**(may be left blank, if same as 2.1 Applicant Data)**2.3.1 Certificate Delivery Address**(for the shipping of original EASA documents)

(Company) Name

Street / Nr

PO Box

Post Code

City

Country

2.3.2 Contact Person
(Shipping)

Title

☐ Mr ☐ Ms

Name

First name

Job title

Phone/Fax

Email

**Application for Approval of Supplemental Type Certificate****3. Identification of Activity****Supplemental Type Certificate**

- ☒ Simple
☐ Standard
☐ Complex

For **revisions** to an STC, please complete an Application for **Major Change/Major Repair Design** or **Minor Change/Minor Repair Design**, as applicable.

For a **transfer** to a new STC holder, please complete an Application for **Transfer of Certificate**.

Including change to approved parts of Flight Manual (FM)

- ☒ Yes
☐ No

4. Product Identification**4.1 Fees & Charges Information****Large Aeroplanes**

- ☐ > 150 000 kg
☐ > 50 000 kg ≤ 150 000 kg
☐ > 22 000 kg ≤ 50 000 kg
☐ > 5 700 kg ≤ 22 000 kg (excluding commuter)

General Aviation

- ☐ > 5 700 kg ≤ 22 000 kg (including commuter)
☐ > 2 000 kg ≤ 5 700 kg
☐ ≤ 2 000 kg
☐ High Performance Aircraft (≤ 5 700 kg)
☐ Very Light Aeroplane
☐ Powered Sailplane
☐ Sailplane
☐ Light Sport Aeroplane

Rotorcraft, Balloons & Airships

- ☐ Large Rotorcraft
☒ Medium Rotorcraft
☐ Small Rotorcraft
☐ Very Light Rotorcraft
☐ Balloon
☐ Large Airship
☐ Medium Airship
☐ Small Airship

Propulsion

- ☐ Turbine Engine > 25 kN take-off thrust
☐ Turbine Engine ≤ 25 kN take-off thrust
☐ Turbine Engine > 2000 kW take-off power
☐ Turbine Engine ≤ 2000 kW take-off power
☐ Non-Turbine Engine
☐ CS-22.H, CS VLR App. B Engine
☐ Propeller for use on aircraft > 5 700 kg MTOW
☐ Propeller for use on aircraft ≤ 5 700 kg MTOW
☐ CS-22J Class Propeller
☐ APU (Parts & Appliances)

4.2 Applicability

Type Certificate Number

EASA.IM.R.146; FAA H11EU; TCCA H-87

Type Certificate Holder

Airbus Helicopters

Type Name

AS355

Model(s)

E, F, F1, F2, N, NP

4.3 Airworthiness Code

CS-27

**Application for Approval of Supplemental Type Certificate****4.4 European Light Aircraft**☐ Non-ELA☐ ELA 1☐ ELA 2

please consult the completion instructions for definitions of ELA 1 and ELA 2 aircraft

5. Original Approval(if applicable)**5.1 Third Country Approval/Project N°**

Approval/Project Number

SH16-29, Issue 1

Issued by

Transport Canada

Issued on

15 August 2016

6. Description**6.1 Title**

Installation of Quick Release Bicycle Rack.

6.2 Description

Installation of bicycle rack on mounting provisions installed in accordance with TCCA STC SH08-16 (EASA STC application submitted)

6.3 Affected Areas
(including manuals)

See Certification Plan CP1002, revision 3; Flight Manual Supplement FMS1002.91, Instructions for Continued Airworthiness ICA1002.90

6.4 Re-Investigations

None

6.5 JustificationTransport Canada has issued an STC.
Identical to EASA STC 10060495.**7. Part 21 demonstration of eligibility****I declare that this application is:**☐ Within the current approved scope of work of the applicant's DOA/ADOA☐ Undertaken by another person than the applicant for, or holder of, a certificate (Part 21.A.2)

Name

(Company) Name

DOA/ADOA N°

DOA/ADOA N°

☐ Following an application for Design Organisation Approval (FO.DOA.00080) or Alternative Procedures to Design Organisation Approval (FO.DOA.00081).

Application Date

Project N°

if known

☐ Following an application for a change to the scope of work via EASA Form FO.DOA.00081 or FO.DOA.00082.

Application Date

Project N°

if known

☒ **Without DOA/ADOA**☐ Use of Article 8.2 of Regulation 748/2012☐ Covered by a Certification Programme in accordance with 21.A20(c) for ELA 1 aircraft or engine/propeller



Application for Approval of Supplemental Type Certificate

installed on an ELA 1 aircraft.


☒ Bilateral Agreement/Working Arrangement is in force

**Application for Approval of Supplemental Type Certificate****8. Applicant's declaration and acceptance of the General Conditions and Terms of Payment**

I declare that I have the legal capacity to submit this application to EASA and that all information provided in this application form is correct and complete.

I have understood that I am submitting an application for which fees or charges will be levied by EASA in accordance with Commission Regulation (EC) on the fees and charges levied by the European Aviation Safety Agency, as last amended and available from <http://easa.europa.eu/> Legislation > Fees & Charges.

I acknowledge that I have read and understood the Agency's Terms of Payment (see <http://easa.europa.eu/> Legislation > Fees & Charges>General Conditions and Terms of Payment) and agree to abide by them. I declare to be aware that fees or charges, as well as all relevant travel costs must be paid whether or not the application is successful and that they might not be refundable. Moreover, I declare that I am aware of the consequences of non-payment.

2018-12-03 POWELL RIVER, BC, CANADA	JEFF CLARKE VICE PRESIDENT	
Date/Location	Name	Signature

Important Note: EASA cannot accept applications without signature. Please make sure that you sign the application.

This Application should be sent by fax, e-mail or regular mail to:

European Aviation Safety Agency
Applications and Outsourcing Services Department
Postfach 10 12 53
D-50452 Köln
Germany

Fax: +49 – (0)221 - 89990 ext. 4458

E-mail: STC@easa.europa.eu

Completion Instructions

Completion
Instructions


Please double-click on the icon to
access the completion instructions



Postfach 10 12 53, D-50452 Cologne

An agency of the European Union 



Deutsche Post 

FRANKIT 3,70 EUR

12.07.19 3D02000494

Brief
PP - PRIORITY

SUPPLEMENTAL TYPE CERTIFICATE

10060495 REV. 2

This Certificate/Approval is issued by EASA, acting in accordance with Regulation (EU) 2018/1139 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 129 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to

AERO DESIGN LTD.

**9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and, if applicable, environmental protection requirements when operated within the conditions and limitations specified below:

Type Certificate Number: EASA.R.008/ EASA.R.146

Type Certificate Holder: AIRBUS HELICOPTERS

Type: AS 350/EC 130

AS 355

Model: AS 350 B1, AS 350 B2, AS 350 B3

AS 350 BA, AS 350 D

AS 355 E, AS 355 F, AS 355 F1

AS 355 F2, AS 355 N, AS 355 NP

Original STC Number: TCCA SH16-29, ISSUE 01

Description of Design Change:

Installation of Quick Release Bicycle Racks.

Installation of Quick Release Bicycle Racks to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL1002-1, Revision 0, dated 12 August 2016, or later approved revision.

Installation of External Attachment Provisions in accordance with STC SH08-16, Configuration A, is a prerequisite for Installation of Quick Release Bicycle Racks.

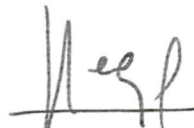
Rev 01 - Correction of Original STC Number.

Rev 02 - Extension of eligibility to AS 355 models.

See Continuation Sheet(s)

For the European Aviation Safety Agency

Cologne, Germany, 08 July 2019



Fabrice LEGAY

Section Manager

Medium & Light Rotorcraft



EASA Certification Basis:

The Certification Basis (CB) for the original product remains applicable to this certificate/ approval.

The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:

Aero Design Ltd. Flight Manual Supplement FMS71002.91, Revision 0, dated 30 June 2016;

Aero Design Ltd. Instructions for Continued Airworthiness ICA1002.90, Revision 0, dated 12 July 2016

or later revisions of the above listed documents approved by EASA in accordance with the Technical Implementation Procedures of EU/ Canada Bilateral Agreement.

Limitations/Conditions:

Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -



European Union Aviation Safety Agency
Applicant Services Department
Postfach 10 12 53
50452 Cologne, Germany

Jeff Clarke
AERO DESIGN LTD.
9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA

Cologne, 11 July 2019

Approval Number: 10060495
EASA Account Number: 300116
Application Type: EASA STC Approval

Please state the **approval number** and your **EASA account number** in all communication with the Agency

Dear Sir or Madam,

Please find enclosed the original(s) of your document(s) issued by the European Aviation Safety Agency.

Should you have further queries, please do not hesitate to contact us. Please assist us by always quoting your EASA account number in any correspondence with the Agency.

Right to Appeal

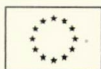
The applicant has the right to appeal in accordance with Article 108-109 of Regulation (EU) No 2018/1139. The appeal notification must be filed in writing at EASA within two months of the date of this notification. Pursuant to Article 15 of Commission Regulation (EU) 319/2014, a charge shall be paid upon lodging the appeal. The amount of the charge is specified in Part II of the Annex of Commission Regulation (EU) 319/2014.

The appeal notification form, as well as further information on the appeal procedure, is available on the Agency's website (<https://www.easa.europa.eu/the-agency/other-easa-boards/easa-board-of-appeal>).

Yours faithfully,

Applicant Services Department
European Union Aviation Safety Agency

This is a computer generated document valid without an EASA signature.



Bike racks

FAA APPLICATION



Transport Canada
Civil Aviation

Transports Canada
Aviation Civile

Suite 820
800 Burrard Street
Vancouver, BC V6Z 2J8

Your file Votre référence

Our file Notre référence
P-16-0276
5010-SH16-29
RDIMS# 13038383

June 7, 2017

Mr. Jeff Clarke, Vice President
Aero Design Ltd.
9888A Malaspina Road
Powell River, BC
V7J 1M8

Subject: FAA Issuance of Supplemental Type Certificate (STC) SR03913NY

Dear Mr. Clarke:

The FAA has issued the subject STC in response to your request. Please take note of the limitations and conditions noted on the certificate.

The original certificate is enclosed along with a copy of "Information Concerning Your Responsibility as a Holder of a Supplemental Type Certificate Issued to a Canadian Applicant" for your information.

A copy of the STC and required documents should accompany each installation.

For any additional information, please do not hesitate to contact the undersigned at (604) 666-8458 or by e-mail to michael.chan@tc.gc.ca.

Yours truly,

Michael Chan
Regional Engineer
Aircraft Certification
Pacific Region

Encl.

**NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590**

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

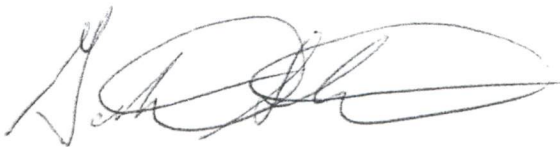
If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.



Gaetano Sciortino
Manager
New York Aircraft Certification Office



United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

IMPORT

Number: SR03913NY

This certificate issued to: Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia V8A 0G3
Canada

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 27 of the Federal Aviation Regulations.

Original Product – Type Certificate Number: Make: Airbus Helicopters
* See attached FAA Approved Model List (AML) Model: * See attached FAA AML No. SR03913NY
No. SR03913NY for the list of approved aircraft
models and applicable airworthiness regulations.

Description of Type Design Change:

1. The installation of Quick Release Bicycle Rack in accordance with Installation Drawing 100201 Revision 0 as listed in AERO Design Ltd. Document Control List DCL1002-1 Revision 0, dated August 12, 2016, Transport Canada approved August 15, 2016 or later Transport Canada approved revision.
2. Operation must be in accordance with Rotorcraft Flight Manual Supplement as listed on AML SR03913NY.
3. Instructions for Continued Airworthiness described in AERO Design Ltd. Instructions for Continued Airworthiness as listed on AML SR03913NY are required for this installation.

Limitations and Conditions:

1. Aircraft equipped with External Attachment Provisions installed per STC SR02680NY Configuration A is a prerequisite for this modifications.
2. A copy of this Certificate and FAA Approved Model List (AML) No. SR03913NY must be maintained as part of the permanent records for the modified aircraft.
3. The installer must determine whether this design change is compatible with previously approved modifications.
4. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, and revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of Application: September 6, 2016

Date Reissued:

Date of Issuance: May 18, 2017

Date Amended:

By Direction of the Administrator

Signature

Title

Gaetano Sciortino
Manager

New York Aircraft Certification Office

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).

FAA APPROVED MODEL LIST (AML) No. SR03913NY
AERO DESIGN LTD.
FOR
QUICK RELEASE BICYCLE RACK

Issue Date: May 18, 2017

ITEM	PART	REGULATION	MAKE	MODEL	ORIGINAL PRODUCT TYPE CERTIFICATE DATA SHEET	REQUIRED DOCUMENTATION		AML AMENDMENT DATE
						ROTORCRAFT FLIGHT MANUAL SUPPLEMENT	INSTRUCTIONS FOR CONTINUED AIRWORTHINESS	
1	27	Federal Aviation	Airbus Helicopters	AS350B, B1, B2, B3, BA, D	H9EU	Aero Design Ltd, FMS1002.91 Revision 0, dated June 30, 2016, Transport Canada approved August 15, 2016 or later Transport Canada approved revision.	Aero Design Ltd., ICA 1002.90 Rev. 0, dated July 12, 2016, Transport Canada accepted July 18, 2016 or later Transport Canada accepted revision.	
2	27	Federal Aviation	Airbus Helicopters	AS355E, F, F1, F2, N, NP	H11EU	Aero Design Ltd. FMS1002.91 Revision 0, dated June 30, 2016, Transport Canada approved August 15, 2016 or later Transport Canada approved revision.	Aero Design Ltd., ICA 1002.90 Rev. 0, dated July 12, 2016, Transport Canada accepted July 18, 2016 or later Transport Canada accepted revision.	

FAA Approved: 



Gaetano Sciortino
Manager, New York
Aircraft Certification Office



Aero Design Ltd.
604-483-AERO (2376)

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

06 September 2016

Transport Canada
Aircraft Certification Division
Suite 620
800 Burrard Street
Vancouver, BC
V6Z 2J8

emailed 06/09/2016
mailed 09/09/2016

Attn: Michael Chan

Your File :

Our File : 940

Re: Airbus Helicopters AS350/AS355 Bicycle Racks – FAA STC Application

Michael,

Please find attached the following documents in support of application for an FAA STC:

Modification Approval Request Application Form		
FAA STC Application Form 8110-12		
Transport Canada STC	SH16-29	Issue 1
Document Control List (Bicycle Rack Installation)	DCL1002-1	Rev. 0
Attachment Provisions Installation	100201	Rev. 0
Instructions for Continued Airworthiness	ICA1002.90	Rev. 0
MSI 53 Review for ICA1002.90 Rev. 0		
Flight Manual Supplement	FMS1002.91	Rev. 0
Document Control List (Bicycle Rack Fabrication)	DCL1002-11	Rev. 0
Bicycle Rack Assembly	100210	Rev. 0
Rack Base Fabrication	100215	Rev. 0
Moving Frame Fabrication	100220	Rev. 0
Fixed Frame Fabrication	100221	Rev. 0
Cam Fabrication	100222	Rev. 0
Roller Fabrication	100223	Rev. 0
Bushing Fabrication	100224	Rev. 0
Strap Fabrication	100225	Rev. 0
Threaded Bushing Fabrication	100226	Rev. 0
Placard	100227	Rev. 0
Beam	100230	Rev. 0
Certification Plan	CP1002	Rev. 3
Declaration of Conformity	DOC1002	Rev. 0
Engineering Report	ER1002.01	Rev. 1
Flight Test Plan and Report	FTP1002.03	Rev. 0
Flight Test Plan and Report	FTP1002.04	Rev. 1
Statement of Compliance	SOC1002-1	Rev. 0
Statement of Compliance	SOC1002-2	Rev. 1
Test Report	TR1002.02	Rev. 0



Aero Design Ltd.
604-483-AERO (2376)

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

A CD with the above data is included for submission to the FAA.

Regards,

Jeff Clarke, P.Tech.(Eng.)
Vice President

Encl.



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

FORM APPROVED
OMB No. 2120-0018
EXP DATE: 11/30/2013

APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE
CERTIFICATE

1. Name Of Applicant Aero Design Ltd.		2. Application made for : <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input type="checkbox"/> Supplemental Type Certificate <input type="checkbox"/> Amended Type Certificate <input checked="" type="checkbox"/> Amended Supplemental Type Certificate		3. Product Involved <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller	
4. Address 9888A Malaspina Road		b. City State Powell River BC, Canada		c. Zip Code V8A 0G3	
5. TYPE CERTIFICATE (Complete item 5a below)					
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material, specifications, construction, and performance of the aircraft, aircraft engine, propeller which is the subject of this application.)					
6. PRODUCTION CERTIFICATE (Complete items 6a-c below. Submit with this form, in manual form, one copy of quality control data or changes thereto covering new products, as required by applicable FAR.)					
a. Factory address (if different from above)		b. Application is for <input type="checkbox"/> New production certificate <input type="checkbox"/> Additions to production Certificate (Give P.C. No.)		P.C. No.	
c. Applicant is holder of or a licensee under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)				T.C./S.T.C. No.	
7. SUPPLEMENTAL TYPE CERTIFICATE (Complete items 7a-d below)					
a. Make and model designation of product to be modified Airbus Helicopters AS350 B, B1, B2, B3, BA, D; AS355 E, F, F1, F2, M, NP					
b. Description of modification Transport Canada Civil Aviation (TCCA) STC SH16-29 - Installation of Quick Release Bicycle Rack on mounting provisions installed in accordance with TCCA STC SH08-16 (FAA STC SR02680NY).					
c. Will data be available for sale or release to other persons? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		d. Will parts be manufactured for sale? (Ref. FAR 21.303) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
8. CERTIFICATION - I certify that the above statements are true. <input checked="" type="checkbox"/>					
Signature of certifying official 		Title Vice President		Date 06 SEPT 2016	



Transport Canada Transports Canada

DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légale du demandeur		Legal name and address of prospective holder Nom et adresse légale du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Airbus Helicopters		Model / Modèle AS350/AS355		Registration / Immatriculation All eligible	
				Serial No. / N° du série All eligible	
				Part No. / N° de la pièce	
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)				<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)				<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type				<input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère	
<input checked="" type="checkbox"/> Revision Révision				Identify Identifier	
No. N° SH16-29				FAA - new STC	
Current Issue Édition active 1					
<input type="checkbox"/> Restricted Category Catégorie restreinte					
Type of Operation Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails.					
Installation of quick release bicycle rack on mounting provisions installed in accordance with STC SH08-16.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H-83 / H-87 (H9EU / H11EU)		Issue No. / N° de l'édition 23 / 10 (23 / 11)		Identify State of Design / Identifier l'état de conception EASA	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification					
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)					
Applicant's remarks / Remarques du demandeur					
Application to FAA for a new STC					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
Name and Signature of Applicant / Nom et signature du demandeur		Title / Poste		Date (yyyy-mm-dd) / Date (aaaa-mm-jj)	
Jeff Clarke		VICE PRESIDENT		2016-09-06	

EASA APPLICATION

BIKE RACKS



Transport Canada Transports Canada

Emailed 06/09/2016

DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur		Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Airbus Helicopters		Model / Modèle AS350		Registration / Immatriculation All eligible	
				Serial No. / N° du série All eligible	
				Part No. / N° de la pièce	
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)				<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)				<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type				<input checked="" type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée.	
<input checked="" type="checkbox"/> Revision Révision No. N° SH16-29				<input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère	
				Identify Identifier EASA - new STC	
<input type="checkbox"/> Restricted Category Catégorie restreinte				Type of Operation Type d'opération	
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails.					
Installation of quick release bicycle rack on mounting provisions installed in accordance with STC SH08-16.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H-83 (R.008)		Issue No. / N° de l'édition 23 (10)		Identify State of Design / Identifier l'état de conception EASA	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification					
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)					
Applicant's remarks / Remarques du demandeur					
Application to EASA for a new STC					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
JEFF CLARKS Name and Signature of Applicant / Nom et signature du demandeur		VICE PRESIDENT Title / Poste		2016-09-06 Date (yyyy-mm-dd) / Date (aaaa-mm-jj)	



Application for Approval of Supplemental Type Certificate

Data protection: Personal data included in this application is processed by EASA pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. It will be processed solely for the purposes of the performance, management and follow-up of the Application by the Agency, without prejudice to possible transmission to internal audit services, to the Court of Auditors, to the European Anti-Fraud Office (OLAF) for the purposes of safeguarding the financial interests of the European Union. The Applicant shall have the right of access to his personal data and the right to rectify any such data that is inaccurate or incomplete. Should the Applicant have any queries concerning the processing of his personal data, he shall address them to the Agency at the following address: dpo[at]easa.europa.eu. The Applicant shall have right of recourse at any time to the European Data Protection Supervisor.

1. Applicant's Reference

1.1 Your Reference

1002

2. Applicant Address and Contact Data

2.1 Applicant Data

2.1.1 Name and Address (registered (business) name and address/legal seat of the company)

Applicant Number	300116	(A)DOA Reference	
(Company) Name	Aero Design Ltd.		
Street / Nr	9888A Malaspina Road		
Post Code	V8A 0G3		
City	Powell River, BC		
Country	Canada		

2.1.2 Contact Person (responsible for this application)

Title	<input checked="" type="checkbox"/> Mr <input type="checkbox"/> Ms	
Name	Clarke	
First name	Jeff	
Job title	Engineering Technologist	
Phone/Fax	Phone: 604-483-2376	Fax: 604-483-2372
Email	jeff@aerodesign.ca	

Important Note: First time applicants need to submit a copy of the company's **Business Registration** or similar legal document stating name and seat of the company together with the application. In case the applicant is not a company but a natural person, a copy of the person's **ID or passport** needs to be provided with the first application.

2.2 Billing Data (may be left blank, if same as 2.1 Applicant Data)

2.2.1 Billing Address (For the receipt of EASA Fees and Charges Invoices. EASA invoices are issued via post- mail to the address provided here.)

(Company) Name	Same as in section 2.1.1 (other name only in exceptional cases)		
Street / Nr			
PO Box			
Post Code			
City			
Country			

2.2.2 Contact Person (Responsible for ensuring the EASA terms of payment are honoured. An electronic invoice copy will be issued to the email address indicated here.)

Title	<input type="checkbox"/> Mr <input checked="" type="checkbox"/> Ms		
Name	Rekve		
First name	Wanda		
Job title	Office Manager		
Phone/Fax	Phone: 604-483-2376	Fax: 604-483-2372	
Email	wanda@aerodesign.ca		

**Application for Approval of Supplemental Type Certificate****2.3 Shipping Data** (may be left blank, if same as 2.1 Applicant Data)**2.3.1 Certificate Delivery Address** (for the shipping of original EASA documents)

(Company) Name

Street / Nr

PO Box

Post Code

City

Country

2.3.2 Contact Person (Shipping)

Title

☐ Mr ☐ Ms

Name

First name

Job title

Phone/Fax

Email

**Application for Approval of Supplemental Type Certificate****3. Identification of Activity****Supplemental Type Certificate**

- ☒ Simple
☐ Standard
☐ Complex

For **revisions** to an STC, please complete an Application for **Major Change/Major Repair Design** or **Minor Change/Minor Repair Design**, as applicable.

For a **transfer** to a new STC holder, please complete an Application for **Transfer of Certificate**.

Including change to approved parts of Flight Manual (FM)

- ☒ Yes
☐ No

4. Product Identification**4.1 Fees & Charges Information****Large Aeroplanes**

- ☐ > 150 000 kg
☐ > 50 000 kg ≤ 150 000 kg
☐ > 22 000 kg ≤ 50 000 kg
☐ > 5 700 kg ≤ 22 000 kg (excluding commuter)

General Aviation

- ☐ > 5 700 kg ≤ 22 000 kg (including commuter)
☐ > 2 000 kg ≤ 5 700 kg
☐ ≤ 2 000 kg
☐ High Performance Aircraft (≤ 5 700 kg)
☐ Very Light Aeroplane
☐ Powered Sailplane
☐ Sailplane
☐ Light Sport Aeroplane

Rotorcraft, Balloons & Airships

- ☐ Large Rotorcraft
☒ Medium Rotorcraft
☐ Small Rotorcraft
☐ Very Light Rotorcraft
☐ Balloon
☐ Large Airship
☐ Medium Airship
☐ Small Airship

Propulsion

- ☐ Turbine Engine > 25 kN take-off thrust
☐ Turbine Engine ≤ 25 kN take-off thrust
☐ Turbine Engine > 2000 kW take-off power
☐ Turbine Engine ≤ 2000 kW take-off power
☐ Non-Turbine Engine
☐ CS-22.H, CS VLR App. B Engine
☐ Propeller for use on aircraft > 5 700 kg MTOW
☐ Propeller for use on aircraft ≤ 5 700 kg MTOW
☐ CS-22J Class Propeller
☐ APU (Parts & Appliances)

4.2 Applicability

Type Certificate Number

EASA.IM.R.008; FAA H9EU; TCCA H-83

Type Certificate Holder

Airbus Helicopters

Type Name

AS350

Model(s)

B, B1, B2, B3, BA, D

4.3 Airworthiness Code

CS-27

**Application for Approval of Supplemental Type Certificate****4.4 European Light Aircraft**☐ Non-ELA☐ ELA 1
☐ ELA 2

please consult the completion instructions for definitions of ELA 1 and ELA 2 aircraft

5. Original Approval(if applicable)**5.1 Third Country Approval/Project N°**

Approval/Project Number

SH16-29, Issue 1

Issued by

Transport Canada

Issued on

15 August 2016

6. Description**6.1 Title**

Installation of Quick Release Bicycle Rack.

6.2 Description

Installation of bicycle rack on mounting provisions installed in accordance with TCCA STC SH08-16 (EASA STC application submitted)

6.3 Affected Areas
(including manuals)

See Certification Plan CP1002, revision 3; Flight Manual Supplement FMS1002.91, Instructions for Continued Airworthiness ICA1002.90

6.4 Re-Investigations

None

6.5 Justification

Transport Canada has issued an STC

7. Part 21 demonstration of eligibility**I declare that this application is:**☐ Within the current approved scope of work of the applicant's DOA/ADOA☐ Undertaken by another person than the applicant for, or holder of, a certificate (Part 21.A.2)

Name

(Company) Name

DOA/ADOA N°

DOA/ADOA N°

☐ Following an application for Design Organisation Approval (FO.DOA.00080) or Alternative Procedures to Design Organisation Approval (FO.DOA.00081).

Application Date

Project N°

if known

☐ Following an application for a change to the scope of work via EASA Form FO.DOA.00081 or FO.DOA.00082.

Application Date

Project N°

if known

☒ **Without DOA/ADOA**☐ Use of Article 8.2 of Regulation 748/2012☐ Covered by a Certification Programme in accordance with 21.A20(c) for ELA 1 aircraft or engine/propeller



Application for Approval of Supplemental Type Certificate

installed on an ELA 1 aircraft.

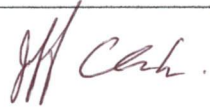
☒ Bilateral Agreement/Working Arrangement is in force

**Application for Approval of Supplemental Type Certificate****8. Applicant's declaration and acceptance of the General Conditions and Terms of Payment**

I declare that I have the legal capacity to submit this application to EASA and that all information provided in this application form is correct and complete.

I have understood that I am submitting an application for which fees or charges will be levied by EASA in accordance with Commission Regulation (EC) on the fees and charges levied by the European Aviation Safety Agency, as last amended and available from <http://easa.europa.eu/> Legislation > Fees & Charges.

I acknowledge that I have read and understood the Agency's Terms of Payment (see <http://easa.europa.eu/> Legislation > Fees & Charges > General Conditions and Terms of Payment) and agree to abide by them. I declare to be aware that fees or charges, as well as all relevant travel costs must be paid whether or not the application is successful and that they might not be refundable. Moreover, I declare that I am aware of the consequences of non-payment.

2016-09-06 POWELL RIVER, BC	JEFF CLARKE VICE PRESIDENT	
Date/Location	Name	Signature

Important Note: EASA cannot accept applications without signature. Please make sure that you sign the application.

<p>This Application should be sent by fax, e-mail or regular mail to:</p> <p>European Aviation Safety Agency Applications and Outsourcing Services Department Postfach 10 12 53 D-50452 Köln Germany</p> <p>Fax: +49 – (0)221 - 89990 ext. 4458 E-mail: STC@easa.europa.eu</p>	<p>Completion Instructions</p> <p> Completion Instructions</p> <p>Please double-click on the icon to access the completion instructions</p>
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Certificate Delivery Team
Applicant Services Department
Resources and Support Directorate

Jeff Clarke
AERO DESIGN LTD.
9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA

Cologne, 06 January 2017

Approval Number: 10060495
EASA Account Number: 300116
Application Type: EASA STC Approval

Please state the **approval number** and your **EASA account number** in all communication with the Agency

Dear Sir or Madam,

Please find enclosed the original(s) of your document(s) issued by the European Aviation Safety Agency.

Should you have further queries, please do not hesitate to contact us. Please assist us by always quoting your EASA account number in any correspondence with the Agency.

Right to Appeal

You have the right to appeal against this decision of the Agency in accordance with Articles 44-51 of Regulation (EC) No 216/2008. The appeal notification must be filed in writing at EASA within two months from the date of notification of this decision; you are required to pay a fee when lodging the appeal. The appeal notification form and further instructions are available from the EASA website: <http://www.easa.europa.eu>.

Yours faithfully,

The Applications Management Team

This is a computer generated document valid without an EASA signature.

SUPPLEMENTAL TYPE CERTIFICATE

10060495

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to:

AERO DESIGN LTD.

**9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Type Certificate Number: EASA.R.008

Type Certificate Holder: AIRBUS HELICOPTERS

Type: AS 350/EC 130

Model: AS 350 B1, AS 350 B2

AS 350 B3

AS 350 BA, AS 350 D

Original STC Number: TCCA SH15-9, ISSUE 01

Description of Design Change:

Installation of Quick Release Bicycle Racks.

Installation of Quick Release Bicycle Racks to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL1002-1, Revision 0, dated 12 August 2016, or later approved revision.

Installation of External Attachment Provisions in accordance with STC SH08-16, Configuration A, is a prerequisite for Installation of Quick Release Bicycle Racks.

See Continuation Sheet(s)

For the European Aviation Safety Agency

Date of Issue: 15 December 2016



Pier Giorgio COLOMBO
Medium Rotorcraft Section
Manager

EASA Certification Basis:

The Certification Basis (CB) for the original product remains applicable to this certificate/ approval.

The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:

Aero Design Ltd. Flight Manual Supplement FMS71002.91, Revision 0, dated 30 June 2016.

Aero Design Ltd. Instructions for Continued Airworthiness ICA1002.90, Revision 0, dated 12 July 2016.

or later revisions of the above listed documents approved by EASA in accordance with the Technical Implementation Procedures of EU/ Canada Bilateral Agreement.

Limitations/Conditions:

Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -

SUPPLEMENTAL TYPE CERTIFICATE

10060495 REV. 1

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to:

AERO DESIGN LTD.

**9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Type Certificate Number: EASA.R.008

Type Certificate Holder: AIRBUS HELICOPTERS

Type: AS 350/EC 130

Model: AS 350 B1, AS 350 B2

AS 350 B3

AS 350 BA, AS 350 D

Original STC Number: TCCA SH16-29, ISSUE 01

Description of Design Change:

Installation of Quick Release Bicycle Racks.

Installation of Quick Release Bicycle Racks to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL1002-1, Revision 0, dated 12 August 2016, or later approved revision.

Installation of External Attachment Provisions in accordance with STC SH08-16, Configuration A, is a prerequisite for Installation of Quick Release Bicycle Racks.

See Continuation Sheet(s)

For the European Aviation Safety Agency

Date of Issue: 05 January 2017


Pier Giorgio COLOMBO
Medium Rotorcraft Section
Manager

EASA Certification Basis:

The Certification Basis (CB) for the original product remains applicable to this certificate/ approval.

The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:

Aero Design Ltd. Flight Manual Supplement FMS71002.91, Revision 0, dated 30 June 2016.

Aero Design Ltd. Instructions for Continued Airworthiness ICA1002.90, Revision 0, dated 12 July 2016.

or later revisions of the above listed documents approved by EASA in accordance with the Technical Implementation Procedures of EU/ Canada Bilateral Agreement.

Limitations/Conditions:

Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -

SUPPLEMENTAL TYPE CERTIFICATE

10060495

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to:

AERO DESIGN LTD.

9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Type Certificate Number: EASA.R.008

Type Certificate Holder: AIRBUS HELICOPTERS

Type: AS 350/EC 130

Model: AS 350 B1, AS 350 B2

AS 350 B3

AS 350 BA, AS 350 D

Original STC Number: TCCA SH15-9, ISSUE 01

Description of Design Change:

Installation of Quick Release Bicycle Racks.

Installation of Quick Release Bicycle Racks to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL1002-1, Revision 0, dated 12 August 2016, or later approved revision.

Installation of External Attachment Provisions in accordance with STC SH08-16, Configuration A, is a prerequisite for Installation of Quick Release Bicycle Racks.

See Continuation Sheet(s)

For the European Aviation Safety Agency

Date of Issue: 15 December 2016


Pier Giorgio COLOMBO
Medium Rotorcraft Section
Manager

10046529

SUPPLEMENTAL TYPE CERTIFICATE - 10060495 - AERO DESIGN LTD. - 300116

EASA Certification Basis:

The Certification Basis (CB) for the original product remains applicable to this certificate/ approval.
The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:

Aero Design Ltd. Flight Manual Supplement FMS71002.91, Revision 0, dated 30 June 2016.
Aero Design Ltd. Instructions for Continued Airworthiness ICA1002.90, Revision 0, dated 12 July 2016.

or later revisions of the above listed documents approved by EASA in accordance with the Technical Implementation Procedures of EU/ Canada Bilateral Agreement.

Limitations/Conditions:

Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -

AME BRAZIL

AS350 Bike RACKS - BRAZIL

CSF 201750 7-02



AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL

Rua Laurent Martins, 209, - Bairro Jardim Esplanada, São José dos Campos/SP, ZIP 12242-431 - Brazil
Phone: 55 12 3203-6600 - <https://www.anac.gov.br>

Ofício nº 568(SEI)/2017/GCPR/GGCP/SAR-ANAC

São José dos Campos, 05 July 2017.

Mr. Jeef Clarke
Vice Presidente
Aero Design, Ltd.
9888A Malaspina Road
Powell River, BC, V8A 0G3
Canada

Subject: Brazilian validation of TCCA STC # SH16-29.

Ref.: Process No. 00066.510354/2017-50 - ANAC Project Number H.02-4859-0.
If you reply to this Office, expressly indicate Process No. 00066.510354/2017-50 SEI No. 0834584

Enclosure: CST # 2017S07-02.

Dear Sir,

1. Please find enclosed the Brazilian Supplemental Type Certificate (CST) # 2017S07-02 related to the Brazilian validation of TCCA STC # SH16-29 (Installation of quick release bicycle racks), applicable to the aircraft models as listed in the Approved Model List (AML).

Yours sincerely,

Cesar Rodrigues Hess
Manager, Certification Programs Branch

Cópies:

PST = 1

Aero (e-mail: jeff@aerodesign.ca)

TCCA (e-mail: michael.chan@tc.gc.ca)



Documento assinado eletronicamente por **CESAR RODRIGUES HESS, Gerente de Programas de Certificação**, em 05/07/2017, às 15:11, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do [Decreto nº 8.539, de 8 de outubro de 2015](#).



A autenticidade deste documento pode ser conferida no site

[http://sistemas.anac.gov.br/sei/controlador_externo.php?](http://sistemas.anac.gov.br/sei/controlador_externo.php?acao=documento_conferir&id_orgao_acesso_externo=0)

[acao=documento_conferir&id_orgao_acesso_externo=0](http://sistemas.anac.gov.br/sei/controlador_externo.php?acao=documento_conferir&id_orgao_acesso_externo=0), informando o código verificador

0834584 e o código CRC **DAA69D08**.

Referência: Caso responda este Ofício, indicar expressamente o Processo nº 00066.510354/2017-50

SEI nº 0834584



CERTIFICADO SUPLEMENTAR DE TIPO
(Supplemental Type Certificate)

NÚMERO: 2017S07-02

(Number)

Este Certificado, emitido com base na Lei nº 7565 "Código Brasileiro de Aeronáutica", de 19 de dezembro de 1986,
This Certificate, issued in the basis of the Law No 7565 "Código Brasileiro de Aeronáutica", dated 19 December 1986,

é conferido ao (à): Aero Design Ltd.
is granted to: 9888A Malaspina Road
Powell Rives, British Columbia
Canada V8A 0G3

por ter a modificação ao projeto de tipo do produto abaixo citado, observadas as limitações e condições especificadas,
for having the change to the type design of the product mentioned below, with the limitations and conditions there for as specified hereon,
satisfeito aos requisitos de aeronavegabilidade aplicáveis.
met the applicable airworthiness requirements.

Produto Original - Número do Certificado de Tipo: * See attached ANAC Approved Model List (AML), Rev. I.R.,
Original Product - Type Certificate No: dated 03 July 2017, or later approved revision.

Fabricante: *
Manufacturer:

Modelo(s): *
Model (s):

DESCRIÇÃO DA MODIFICAÇÃO AO PROJETO DE TIPO:
Description of Type Design Change:

Installation of Quick Release Bicycle Racks in accordance with Aero Design Ltd. Document Control List, Document No. DCL1002-1, Rev. 0, dated 12 Aug. 2016, or later approved revision.

This CST validates in Brazil the STC No. SH16-29, issued by TCCA (Canada).

LIMITAÇÕES E CONDIÇÕES:
Limitations and Conditions:

See continuation sheet for applicable data.

DATAS:
Dates of:

Do requerimento: 23 Mar. 2017
Application:

Da emissão: 03 July 2017
Issuance:

Da reemissão:*Reissuance:***Da emenda:***Amendment:*


MÁRIO IGAWA
Gerente-Geral, Certificação de Produto Aeronáutico
(General Manager, Aeronautical Product Certification)


ROBERTO JOSÉ SILVEIRA HONORATO
Superintendente de Aeronavegabilidade
(Airworthiness Superintendent)

F-400-01G (SEI 03.17)

Fl. 01 de 02

H.02-4859-0

Nota:*(Note:)*

a) Este Certificado e os dados técnicos com base nos quais ele foi emitido são válidos até que sejam cancelados,

(This Certificate and the supporting technical data used for approval shall remain in effect until surrendered,

suspensos, revogados ou um prazo limite seja estabelecido pela Agência Nacional de Aviação Civil.

suspended, revoked or a termination date is otherwise established by the Agência Nacional de Aviação Civil.)

b) No caso de transferência de propriedade deste Certificado, o transferente deve preencher o quadro "Endosso

(In case of transfer of the property of this Certificate, the grantor should fill the blanks of

de Transferência", e o adquirente deve enviar este Certificado à Gerência Geral de Certificação de

"Transfer Endorsement", and the transferee must remit this Certificate to the Gerência Geral de Certificação de

Produto Aeronáutico para que seja reemitido em seu nome.

Produto Aeronáutico to permit reissuance of the Certificate in his name.)

ENDOSSO DE TRANSFERÊNCIA*(Transfer Endorsement)***Transfiro a propriedade deste Certificado Suplementar de Tipo para:***(I transfer the property of this Supplemental Type Certificate to:)***ADQUIRENTE***(Transferee)*

Nome:

(Name:)

Rua:

(Street:)

CEP: **Cidade:** **Estado:** **País:**

*(Zip:)**(City:)**(State:)**(Country:)***TRANSFERENTE***(Grantor)*

Nome:
(Name:)

Rua:
(Street:)

CEP: **Cidade:** **Estado:** **País:**
(Zip:) (City:) (State:) (Country:)

Data de Transferência:
(Date of Transfer:)

Assinatura do Transferente:
(Signature of the Grantor:)

Nome:
(Name:)

Cargo:
(Function:)



Folha de Continuação ao
(Continuation Sheet to)

CERTIFICADO SUPLEMENTAR DE TIPO
(Supplemental Type Certificate)

NÚMERO: 2017S07-02
(Number)

LIMITAÇÕES E CONDIÇÕES:
Limitations and Conditions:

- I. The approval of this type design change should not be extended to other rotorcraft of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in Type Design, will introduce no adverse effect upon the airworthiness of that rotorcraft.
- II. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.
- III. Operation must be performed in accordance with the TCCA approved Rotorcraft Flight Manual

Supplement (RFMS), Aero Design Ltd. Document No. FMS1002.91, Rev. 0, dated 30 June 2016, approved on 15 Aug. 2016, or later approved revision.

- IV. The maintenance of the rotorcraft shall be performed in accordance with the Instructions for Continued Airworthiness (ICA), Aero Design Ltd. Document No. ICA 1002.90, Rev. 0, dated 12 July 2016, or later accepted revision.
- V. Installation of External Attachment Provisions (Configuration A) in accordance with ANAC CST No. 2017S07-01 which validates in Brazil the TCCA STC No. SH08-16, is a prerequisite for the installation of the Quick Release Bicycle Racks.
- VI. A copy of this Certificate, the Supplement referred on item III above and the ANAC Approved Model List (AML) for CST No. 2017S07-02 shall be maintained as part of the permanent records for the modified rotorcraft.

-----END-----

F-400-01G (SEI 03.17)

Fl. 02 de 02

H.02-4859-0



Documento assinado eletronicamente por **MARIO IGAWA, Gerente-Geral de Certificação de Produtos Aeronáuticos**, em 05/07/2017, às 15:57, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do [Decreto nº 8.539, de 8 de outubro de 2015](#).



Documento assinado eletronicamente por **ROBERTO JOSÉ SILVEIRA HONORATO, Superintendente de Aeronavegabilidade**, em 07/07/2017, às 18:15, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do [Decreto nº 8.539, de 8 de outubro de 2015](#).



A autenticidade deste documento pode ser conferida no site http://sistemas.anac.gov.br/sei/controlador_externo.php?acao=documento_conferir&id_orgao_acesso_externo=0, informando o código verificador **0828961** e o código CRC **FF1BFD7B**.

ANAC LISTA DE MODELOS APROVADOS (LMA) PARA CST
(ANAC APPROVED MODEL LIST (AML) FOR (CST))

NÚMERO: 2017S07-02

(Number)

ITEM	ROTORCRAFT MAKE	ROTORCRAFT MODEL(S)	TYPE CERTIFICATE NUMBER
1	Airbus Helicopters	AS 350 B	R.008 (EASA)
2	Airbus Helicopters	AS 350 B1, AS 350 B2, AS 350 B3, AS 350 BA	8812 (ANAC)
3	Airbus Helicopters	AS 355 F, AS 355 F1, AS 355 F2, AS 355 N, AS 355 NP	8809 (ANAC)

Aprovação ANAC:

(ANAC Approval:)

MÁRIO IGAWA

Gerente-Geral, Certificação de Produto Aeronáutico
(General Manager, Aeronautical Product Certification)

Data da aprovação ANAC: 03 July 2017

(ANAC Approval Date:)

I.R.

Revisão:

(Rev.:)

F-400-01-Anexo (AML)

Fl. 01 de 01

H.02-4859-0



Documento assinado eletronicamente por **MARIO IGAWA**, Gerente-Geral de Certificação de **Produtos Aeronáuticos**, em 04/07/2017, às 15:51, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do [Decreto nº 8.539, de 8 de outubro de 2015](#).

A autenticidade deste documento pode ser conferida no site

http://sistemas.anac.gov.br/sei/controlador_externo.php?

[acao=documento_conferir&id_orgao_acesso_externo=0](#), informando o código verificador **0819884** e o código CRC **347EE04F**.



Referência: Processo nº 00066.510354/2017-50

SEI nº 0819884



23 March 2017

Transport Canada
Aircraft Certification Division
Suite 620
800 Burrard Street
Vancouver, BC
V6Z 2J8

Attn: Michael Chan

Your File :
Our File : 1002

Re: Airbus Helicopters AS350/AS355 Bicycle Racks – Brazilian STC Application

Michael,

Please find attached the following documents in support of application for a new Brazilian STC:

✓ Modification Approval Request Application Form		
✓ ANAC STC Application Form F-300-11E		
✓ Transport Canada STC	SH16-29	Issue 1
✓ EASA STC	10060495	Rev. 1
<i>Bike rack</i> ✓ Document Control List (Bicycle Rack Installation)	DCL1002-1	Rev. 0
✓ Attachment Provisions Installation	100201	Rev. 0
✓ Instructions for Continued Airworthiness	ICA1002.90	Rev. 0
✓ MSI 53 Review for ICA1002.90 Rev. 0		
✓ Flight Manual Supplement	FMS1002.91	Rev. 0
✓ Document Control List (Bicycle Rack Fabrication)	DCL1002-11	Rev. 0
✓ Bicycle Rack Assembly	100210	Rev. 0
✓ Rack Base Fabrication	100215	Rev. 0
✓ Moving Frame Fabrication	100220	Rev. 0
✓ Fixed Frame Fabrication	100221	Rev. 0
✓ Cam Fabrication	100222	Rev. 0
✓ Roller Fabrication	100223	Rev. 0
✓ Bushing Fabrication	100224	Rev. 0
✓ Strap Fabrication	100225	Rev. 0
✓ Threaded Bushing Fabrication	100226	Rev. 0
✓ Placard	100227	Rev. 0
✓ Beam	100230	Rev. 0
✓ Certification Plan	CP1002	Rev. 3
✓ Declaration of Conformity	DOC1002	Rev. 0
✓ Engineering Report	ER1002.01	Rev. 1
✓ Flight Test Plan and Report	FTP1002.03	Rev. 0
✓ Flight Test Plan and Report	FTP1002.04	Rev. 1
✓ Statement of Compliance	SOC1002-1	Rev. 0
✓ Statement of Compliance	SOC1002-2	Rev. 1
✓ Test Report	TR1002.02	Rev. 0

signed undertaking



Aero Design Ltd.
604-483-AERO (2376)


9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

A CD with the above data is included for submission to ANAC.

Regards,

Jeff Clarke, P.Tech.(Eng.)
Vice President

Encl.

6. SUPPLEMENTAL TYPE CERTIFICATION:	
<p>A. Make and model designation of product to be modified:</p> <p>Airbus Helicopters AS350 B, BA, B1, B2, B3</p> <p>Airbus Helicopters AS355 D, E, F, F1, F2, N, NP</p>	
<p>B. Description of modification:</p> <p>Installation of quick release bicycle racks.</p>	
<p>C.: Will data be available for sale or release to other persons?</p> <p style="text-align: center;"><input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p>	
<p>D.: Will parts be manufactured for sale?</p> <p style="text-align: center;"><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p>	
7. ATTESTATION OF APPROVED AERONAUTICAL PRODUCT (except aircraft, aircraft engine and propeller)	
<p>A. Parts or components designation</p> 	
<p>B. Specification adopted</p> 	
<p>Obs.: For a better identification of the product, technical data (drawings, test reports, material specification) must be included.</p>	
<p>C. Factory address</p> 	
8. Applicant statement, signature and date:	
<p>I, <u>Jeff Clarke</u> _____, certify that above informations are true.</p> <div style="text-align: right; margin-top: 20px;">  _____ Signature </div> <div style="text-align: right; margin-top: 20px;"> _____ Vice President [Title] </div> <div style="display: flex; justify-content: space-between; margin-top: 30px;"> <div style="text-align: center;"> <u>23 / 03 / 17</u> Date </div> <div style="text-align: center;"> <u>jeff@aerodesign.ca, 604-483-2376</u> email and phone </div> </div>	



Transport Canada Transports Canada

DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légale du demandeur		Legal name and address of prospective holder Nom et adresse légale du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque		Model / Modèle		Registration / Immatriculation	
Airbus Helicopters		AS350/355 (all)		All eligible	
Serial No. / N° du série		Part No. / N° de la pièce			
All eligible					
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)				<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)				<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type					
<input checked="" type="checkbox"/> Revision Révision				Identify Identifier	
No. N° SH16-29				Brazil - new STC	
Current Issue Édition active 1					
<input type="checkbox"/> Restricted Category Catégorie restreinte					
Type of Operation Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails.					
Quick Release Bicycle Rack Installation - Installation of quick release bicycle rack on mounting provisions installed in accordance with STC SH08-16.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT		Issue No. / N° de l'édition		Identify State of Design / Identifier l'état de conception	
H-83, H-87		23, 9		EASA	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification					
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)					
Applicant's remarks / Remarques du demandeur					
Application to ANAC in Brazil for new STC					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie 1 du RAC (sous-partie 104 du RAC - Redevances).					
JEFF CLARKE		VICE-PRESIDENT		2017-03-23	
Name and Signature of Applicant Nom et signature du demandeur		Title / Poste		Date (yyyy-mm-dd) / Date (aaaa-mm-jj)	

Brazil

DOCUMENT CONTROL LIST

(The Current Approval/Configuration Control List for Fabricated Parts, Assemblies and Other Documents and a Complete Listing of the Applicable Design Compliance Documents)

Paper

DCL REV.	DOCUMENT NO.	DOC REV.	DOC REV. DATE	DOCUMENT CONTENT
FABRICATION AND ASSEMBLY DOCUMENTS				
0	100210	0	30/06/2016	Bicycle Rack Assembly
0	100215	0	13/06/2016	Rack Base Fabrication
0	100220	0	13/06/2016	Moving Frame Fabrication
0	100221	0	14/06/2016	Fixed Frame Fabrication
0	100222	0	29/06/2016	Cam Fabrication
0	100223	0	04/09/2015	Roller Fabrication
0	100224	0	30/06/2016	Bushing Fabrication
0	100225	0	13/06/2016	Strap Fabrication
0	100226	0	15/06/2015	Threaded Bushing Fabrication
0	100227	0	29/06/2016	Placard
0	100230	0	13/06/2016	Beam

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	12/08/2016	Jeff Clarke	TCCA - Pacific	Original

APPROVAL:


Aero Design Ltd.

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3
Tel: 604.483.2376 www.aerodesign.ca

Airbus Helicopters (Eurocopter)
AS350 & AS355 Series
Quick Release Bicycle Rack Assembly

Document Control List Number

DCL1002-11

Revision

0

Sheet

1 of 2

✓

DOCUMENT CONTROL LIST

[illegible]



Document Control List Number	Revision	Sheet
DCL1002-11	0	2 of 2

DOCUMENT CONTROL LIST

(Listing of Current Approved and Accepted Documents)

DCL REV.	DOCUMENT NO.	DOC REV.	DOC REV. DATE	DOCUMENT CONTENT
APPROVAL DOCUMENT				
0	SH16-29	1	15/08/2016	TCCA STC Approval, approval date 15/08/2016
DOCUMENTS SITED ON THE APPROVAL DOCUMENT				
0	100201	0	07/07/2016	Quick Release Bicycle Rack Installation
0	ICA1002.90	0	12/07/2016	Instructions for Continued Airworthiness
0	FMS1002.91	0	30/06/2016	Flight Manual Supplement
FABRICATION AND OTHER DOCUMENTS				
0	DCL1002-11	0	12/08/2016	Document Control List for Quick Release Bicycle Rack Assembly

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	12/08/2016	Jeff Clarke	TCCA - Pacific	Original

APPROVAL: 	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca		
	Airbus Helicopters (Eurocopter) AS350 & AS355 Series Quick Release Bicycle Rack Installation		
	Document Control List Number DCL1002-1	Revision 0	Sheet 1 of 1

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCCA	DAR 304	DAR 370	Comments
27.613	16	Material Strength Properties and Design Values	Values used as per AR-MMPDS-01		X		
27.625	0	Fitting Factor	Analysis		X		
27.783	0	Doors	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval
27.807	21	Emergency Exits	Statement in report ER1002.01 (AS350/AS355)		X		Installation does not block doors from opening Bike rack is located aft of cabin doors
27.865	11	External Loads	Analysis in report ER1002.01 (AS350/AS355) and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		
27.1387	7	Position Light System Dihedral Angles	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
27.1401	10	Anticollision Light System	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
Subpart F – Equipment							
27.1309	0	Equipment, Systems, and Installations	Hazard Assessment in Flight Test Plan Flight Manual Supplement FMS1002.91 (AS350/AS355)	X			Secondary restraining strap required for bikes with slotted wheel attachment to mitigate risk of bike departing rack; requirement noted in FMS.
Subpart G – Operating Limitations and Information							
27.1505	14	Never Exceed Speed	Flight Test, Flight Manual Supplement FMS1002.91 (AS350/AS355)	X			V _{NE} limits to be determined by flight test
27.1525	21	Kinds of Operation	FMS1002.91 (AS350/AS355)	X			Limited to VFR only.
27.1529	18	Instructions for Continued Airworthiness	ICA Provided, ICA1002.90		X		
27.1541	0	Markings and Placards - General	Placard provided with loading limitations	X			Placard is engraved aluminum, installed on bike rack IAW drawings and ICA
27.1557	14	Miscellaneous Markings and Placards	Not applicable				
27.1581	14	Rotorcraft Flight Manual – General	FMS1002.91 (AS350/AS355)	X			



Transport
Canada

Transports
Canada

FROM: ROUTING SYMBOL
DE: SYMBOLE D'ACHEMINEMENT

Suite 820 - 800 Burrard Street
Vancouver, B.C. V6Z 2J8
Designator: TAHI



PB0315081617
002660 N9S9S
0824 103458

CANADA
POST CANADA
02.77
V6Z 2J8 2016.08.24

To

Mr. Jeff Clarke

Aero Design Ltd.

9888 A Malaspina Road

Powell River, BC

Canada V8A 0G3

Canada

02-0042 (0802-06)

PLEASE USE ROUTING SYMBOL ON ALL CORRESPONDENCE

PRIÈRE D'INDIQUER VOTRE SYMBOLE D'ACHINEMENT SUR
TOUTE CORRESPONDANCE

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Transport
Canada
Civil Aviation

Transports
Canada
Aviation Civile

Suite 620
800 Burrard Street
Vancouver, B.C.
V6Z 2J8

August 22, 2016

Your file Votre référence

Our file Notre référence

SH16-29

RDIMS #12223323

Mr. Jeff Clarke
Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC
Canada V8A 0G3

Dear Mr. Clarke,

Subject: Issue of Supplemental Type Certificate (STC) SH16-29 Issue 1

This STC is issued in response to your application. The transfer of this document in the name of another person requires a prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 521.357.

Embodiment of modifications requiring certification of detail part fabrication and installation, in accordance with approved data identified on the certificate is considered to be a maintenance activity and the requirements of subsection 571.06(4) of the CARs will apply.

A Canadian Holder is required to fulfill the responsibilities of a Design Approval Document Holder in accordance with Subpart 521 of the CARs, Division VIII, including the reporting of any service difficulties experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change; it is your responsibility to submit a Service Difficulty Report to Transport Canada.

Should you require any additional information, please do not hesitate to contact the undersigned at (604) 666-8458.

Yours truly,

Michael Chan
Regional Engineer
Aircraft Certification
Pacific Region
Encl. ()



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC
Canada V8A 0G3

Number: SH16-29

Issue No.: 1

Approval Date: August 15, 2016

Issue Date: August 15, 2016

Responsible Office:

Pacific

Aircraft/Engine Type or Model:

Airbus Helicopters AS350 B, B1, B2, B3, BA, D
Eurocopter AS355 E, F, F1, F2, N, NP

Registration/Serial No.:

All eligible

Canadian Type Certificate or Equivalent:

H-83 (AS350 series), H-87 (AS355 Series)

Description of Type Design Change:

Installation of Quick Release Bicycle Racks

Installation/Operating Data, Required Equipment and Limitations:

Quick Release Bicycle Racks shall be installed in accordance with (iaw) Aero Design Ltd. Document Control List, DCL1002-1, Revision 0, dated 12 August 2016, or later TCCA approved revision.

Required Equipment: Installation of External Attachment Provisions iaw STC SH08-16, Configuration A, is a prerequisite for installation of the Quick Release Bicycle Racks.

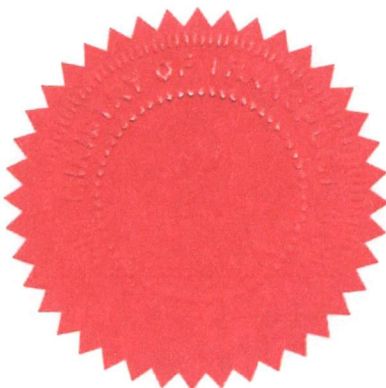
Modified rotorcraft shall be operated iaw Aero Design Ltd. Flight Manual Supplement FMS1002.91, Revision 0, dated 30 June 2016, or later TCCA approved revision.

Modified rotorcraft shall be maintained iaw Aero Design Ltd. Instructions for Continued Airworthiness ICA1002.90, Revision 0, dated 12 July 2016, or later TCCA accepted revision.

Basis of certification remains as defined in the applicable Type Certificate Data Sheets.

— End —

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



Michael Chan
For Minister of Transport

DESIGN APPROVAL DOCUMENT TRANSFER

Transfer of this design approval document requires the prior approval of the Minister and the reissue of this document in the name of the transferee.

The reissue of this design approval document in the name of the transferee will be contingent on the holder and the transferee fulfilling their responsibilities as described in section 521.357 of the *Canadian Aviation Regulations*.

I have reviewed the above requirements and recognize that until the above requirements are met the certificate and all its privileges and obligations will not be transferred.

Signature of holder/signature du titulaire

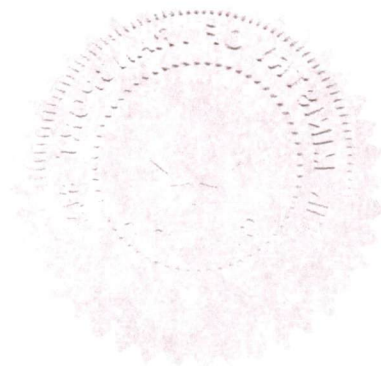
TRANSFERT DU DOCUMENT D'APPROBATION DE LA CONCEPTION

L'approbation préalable du ministre est exigée en vue d'un transfert de ce document d'approbation de la conception et la réédition de ce document au nom du cessionnaire.

La réédition de ce document d'approbation de la conception au nom du cessionnaire est conditionnelle à la satisfaction des exigences et des responsabilités, du titulaire et du cessionnaire, décrites dans l'article 521.357 du *Règlement de l'aviation canadien*.

J'ai examiné les conditions susmentionnées et je comprends que le transfert du certificat et des privilèges et des obligations s'y rattachant ne sera pas effectué tant que ces conditions n'auront pas été respectées.

date/date







7.12 Schedule

The following schedule is proposed and will be updated as items are changed or completed.

Proposed target completion date: ASAP

7.12.1 Airbus Helicopters AS350 / AS355

Item	Deliverable	TCCA Level of Involvement / Service	Submission Date (proposed)	Approval / Acceptance (initial)	Date
Certification Plan	CP1002	Accept certification plan	20/04/2016	TCCA –Pac M.C. (Rev. 2)	04/03/2016
Flight test plan (Section 7.2.5)	FTP1002.03	Accept test plan	26/05/2016	N/A – company R&D	
Flight test plan (Section 7.2.5)	FTP1002.04	Accept test plan	16/05/2016	TCCA-HQ T.B.	30/05/2016
Engineering Report – Air Drag Loads (Section 7.3.5)	ER1002.01	Accept air drag loads	11/04/2016	TCCA –Pac M.C.	19/04/2016
Engineering Report (Section 7.7.5, 7.9.5)	ER1002.01	Finding of compliance to FAR 27.783, .1387, .1401	11/04/2016		15/08/2016
Flight Manual Supplement (Section 7.10.5)	FMS1002.91	Review and approval	18/07/2016		15/08/2016
ICA (Section 7.11.5) (MSI 53)	ICA1002.90	Review and acceptance	19/07/2016		15/08/2016
Findings of Compliance (Section 7.2.5, 7.3.5, 7.5.5, 7.7.5, 7.9.5, 7.10.5)	CP1002 (checklist)	Finding of compliance to indicated paragraphs on compliance program checklist (Appendix A)	05/07/2016		15/08/2016

8.0 SI 521-005 – SECTION 9.2 – AML STC CONSIDERATIONS

The bicycle rack installations are to be applied to multiple models of aircraft on separate type certificates. SI 521-005 section 9.2 and Appendix H specify the instructions to be followed for issuance of an AML STC.

The type certificates for each model are listed in section 5.1. The bicycle rack configuration installed on the AS350 and AS355 models is identical, but each model is on a separate type certificate. The aircraft are identical in the area of this modification.

(1) An Approved Model List (AML) process may be appropriate to approve the installation of a change on more than one type-certificated product, provided:

(a) the installation instructions for the change on each type-certificated product are specific and objective;

Installation drawing 100201 applies to AS350 and AS355 models.

(b) the evaluation of the effect of the change applies to all type-certificated products addressed by the approval; and

Evaluation of the changes to the AS350 and AS355 are identical.

(c) demonstrations of compliance, substantiating data and necessary type design data for each of the models listed on the AML STC is provided.

Demonstrations of compliance, substantiating data and type design data are listed on Document Control Lists:

DCL1002-1 and DCL1002-11 for AS350 and AS355 models

(2) An AML STC is an STC covering several aeronautical products of differing types or models, approved under separate type certificates within the same AWM Chapter and as such shall only be issued by TCCA.

STC is to be issued by TCCA.

(3) An AML STC may only be issued for aircraft makes and models of a single type i.e. same or comparable design standards. For example, an AML STC may not include aircraft certified against the standards of Chapters 523 and 525 of the AWM on the same certificate.

AS350 and AS355 models are certified to the standards of FAR 27. AS355NP is not eligible for category A operations with the bicycle rack installed, making the FAR 29 paragraphs of the basis of certification not applicable to this installation.

(4) If the modification is significant under CPR then an AML cannot be used, or if the modification is significant for a particular type, then it should be separated off to its own STC.

The modification is not significant for any model, see section 5.5.

(5) Additional guidance on AML STCs is provided in Appendix H of this SI.

Appendix H has been demonstrated above. The same FMS is applicable to the AS350 and AS355 (paragraph 8). ICA are provided, which address all models (paragraph 10).

APPENDIX A

COMPLIANCE PROGRAM CHECKLIST –

AIRBUS HELICOPTERS AS350, AS355

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3


DATE: 29 April 2015
REVISION No. 3, 07 July 2016



CORRESPONDANCE TO:
(If other than applicant)

MAKE: Airbus Helicopters
MODEL: AS350 (all models), AS355 (all models)


REGISTRATION: All Eligible
SERIAL No.: All Eligible

NATURE OF WORK: Quick Release Bike Rack Installation
TYPE CERTIFICATE DATA SHEET: H-83, H-87
MODEL CERTIFICATION BASIS: FAR 27 at Amdt. 27-20, plus select sections of amdt. 27-21 (AS355NP basis of certification)
MODIFICATION CERTIFICATION BASIS: Same as original basis of certification

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart B - Flight							
27.21	21	Proof of Compliance	Flight Test	 X			See comments for flight test below
27.29	14	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X		
27.45	21	Performance - General	Flight Test			X	
27.51	0	Takeoff data: General	Flight Test			X	
27.65	14	Climb: All Engines Operating	Flight Test			X	
27.71	21	Glide Performance	Flight Test			X	
27.73	14	Performance at Min. Operating Speed	Flight Test			X	Preliminary flight tests performed by Aero
27.75	0	Landing	Flight Test			X	Design in accordance with Flight Test
27.141	19	Flight Characteristics - General	Flight Test			X	Plan FTP1002.03 (AS350/AS355)
27.143	21	Controllability and Maneuverability	Flight Test			X	Certification flight tests performed by
27.171	0	Stability - General	Flight Test			X	TCCA test pilot DAR 370 in accordance
27.173	21	Static Longitudinal Stability	Flight Test			X	with Flight Test Plan
27.175	21	Demonstration of Longitudinal Stability	Flight Test			X	FTP1002.04(AS350/AS355)
27.177	21	Static Directional Stability	Flight Test			X	
27.241	0	Ground Resonance	Flight Test			X	
27.251	0	Vibration	Flight Test			X	

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart C – Strength Requirements							
27.301	0	Loads – Air Drag Loads	Analysis in report ER1002.01 (AS350/AS355) 	X			
27.301	0	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X		
27.303	0	Factor of Safety	Analysis in report ER1002.01 (AS350/AS355)		X		
27.305	0	Strength and Deformation	Analysis in report ER1002.01 (AS350/AS355)		X		
27.307	3	Proof of Structure			X		
27.337(a)	0	Limit Maneuvering Load Factor	and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		Critical load factor in vertical direction.
27.547	3	Main Rotor Structure	Flight Test			X	See comments for flight test above
27.561(b)(3)	0	Occupant Protection	N/A		X		Not an item of mass inside the cabin
27.561(c)	0	Items of Mass	N/A		X		Bike racks are outboard of cabin occupants. i.e., bike racks are not located above/behind the cabin.
			Statement in report ER1002.01 (AS350/AS355)				Forward deflection or failure of bike rack poses no threat to occupants of cabin.
							27.337 Maneuvering Loads are critical vertical loads.
Subpart D – Design and Construction							
27.601	0	Design	Review and Inspect; functional test in TR1002.02 (AS350/AS355)		X		
27.603	16	Materials	Drawings		X		Materials as specified in AR-MMPDS-01
27.605	16	Fabrication Methods	Drawings		X		Design is conventional.
27.609	0	Protection of Structure	Drawings		X		
27.610(b)(1)	21	Lightning Protection	Statement per section 7.5 - bonded all metal construction, see installation drawings and ICA 	X			Bonding, protection and procedures iaw Airbus AMM and SPM.
27.611	0	Inspection Provisions	Drawings		X		Design is easy to inspect.

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
27.613	16	Material Strength Properties and Design Values	Values used as per AR-MMPDS-01		X		
27.625	0	Fitting Factor	Analysis		X		
27.783	0	Doors	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval
27.807	21	Emergency Exits	Statement in report ER1002.01 (AS350/AS355)		X		Installation does not block doors from opening Bike rack is located aft of cabin doors
27.865	11	External Loads	Analysis in report ER1002.01 (AS350/AS355) and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		
27.1387	7	Position Light System Dihedral Angles	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
27.1401	10	Anticollision Light System	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
Subpart G – Operating Limitations and Information							
27.1505	14	Never Exceed Speed	Flight Test, Flight Manual Supplement FMS1002.91 (AS350/AS355)	X			V _{NE} limits to be determined by flight test
27.1525	21	Kinds of Operation	FMS1002.91 (AS350/AS355)	X			Limited to VFR only.
27.1529	18	Instructions for Continued Airworthiness	ICA Provided, ICA1002.90		X		
27.1541	0	Markings and Placards - General	Compliance with 27.1557 below	X			Placard is engraved aluminum, installed on bike rack IAW drawings and ICA
27.1557	14	Miscellaneous Markings and Placards	150 lb design cargo load		X		
27.1581	14	Rotorcraft Flight Manual – General	FMS1002.91 (AS350/AS355)	X			
27.1583(c)	16	Operating Limitations – Weight and Loading Information	FMS1002.91 (AS350/AS355)	X			
27.1585	21	Operating Procedures	FMS1002.91 (AS350/AS355)	X			
27.1587	21	Performance Information	FMS1002.91 (AS350/AS355)	X			
27.1589	0	Loading Information	FMS1002.91 (AS350/AS355) and Placard	X			Placard installed on bike rack, instructions provided.

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
AWM 527 Requirements							
527.1581 (e)	3	Flight Manual – Metric Units	FMS1002.91 (AS350/AS355)	 X			Metric units provided

APPENDIX B

CHANGED PRODUCT RULE DECISION RECORD

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3

DATE: 29 April 2015
REVISION No. 3, 07 July 2016

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Airbus Helicopters
MODEL: AS350 (all models), AS355 (all models)

REGISTRATION: All Eligible
SERIAL No.: All Eligible

NATURE OF WORK: Quick Release Bike Rack Installation

TYPE CERTIFICATE DATA SHEET: H-83, H-87

MODEL CERTIFICATION BASIS: FAR 27 at Amdt. 27-20, plus select sections of amdt. 27-21 (AS355NP basis of certification)

MODIFICATION CERTIFICATION BASIS: Same as original basis of certification

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart B - Flight							
27.21	21	Proof of Compliance	Flight Test	X			See comments for flight test below
27.29	14	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X		
27.45	21	Performance - General	Flight Test			X	
27.51	0	Takeoff data: General	Flight Test			X	
27.65	14	Climb: All Engines Operating	Flight Test			X	
27.71	21	Glide Performance	Flight Test			X	
27.73	14	Performance at Min. Operating Speed	Flight Test			X	
27.75	0	Landing	Flight Test			X	
27.141	19	Flight Characteristics - General	Flight Test			X	
27.143	21	Controllability and Maneuverability	Flight Test			X	
27.171	0	Stability - General	Flight Test			X	
27.173	21	Static Longitudinal Stability	Flight Test			X	
27.175	21	Demonstration of Longitudinal Stability	Flight Test			X	
27.177	21	Static Directional Stability	Flight Test			X	
27.241	0	Ground Resonance	Flight Test			X	
27.251	0	Vibration	Flight Test			X	

Michel Brilotte
DAR 370
12 Aug 2016

Preliminary flight tests performed by Aero Design in accordance with Flight Test Plan FTP1002.03 (AS350/AS355)

Certification flight tests performed by TCCA test pilot DAR 370 in accordance with Flight Test Plan FTP1002.04(AS350/AS355)

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart C – Strength Requirements							
27.301	0	Loads – Air Drag Loads	Analysis in report ER1002.01 (AS350/AS355)	X			
27.301	0	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X		
27.303	0	Factor of Safety	Analysis in report ER1002.01 (AS350/AS355)		X		
27.305	0	Strength and Deformation	Analysis in report ER1002.01 (AS350/AS355)		X		
27.307	3	Proof of Structure			X		
27.337(a)	0	Limit Maneuvering Load Factor	and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		Critical load factor in vertical direction.
27.547	3	Main Rotor Structure	Flight Test			X	See comments for flight test above
27.561(b)(3)	0	Occupant Protection	N/A		X		Not an item of mass inside the cabin
27.561(c)	0	Items of Mass	N/A		X		Bike racks are outboard of cabin occupants. i.e., bike racks are not located above/behind the cabin.
			Statement in report ER1002.01 (AS350/AS355)				Forward deflection or failure of bike rack poses no threat to occupants of cabin.
							27.337 Maneuvering Loads are critical vertical loads.
Subpart D – Design and Construction							
27.601	0	Design	Review and Inspect; functional test in TR1002.02 (AS350/AS355)		X		
27.603	16	Materials	Drawings		X		Materials as specified in AR-MMPDS-01
27.605	16	Fabrication Methods	Drawings		X		Design is conventional.
27.609	0	Protection of Structure	Drawings		X		
27.610(b)(1)	21	Lightning Protection	Statement per section 7.5 - bonded all metal construction, see installation drawings and ICA	X			Bonding, protection and procedures iaw Airbus AMM and SPM.
27.611	0	Inspection Provisions	Drawings		X		Design is easy to inspect.

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
27.613	16	Material Strength Properties and Design Values	Values used as per AR-MMPDS-01		X		12 AUG 2016
27.625	0	Fitting Factor	Analysis		X		
27.783	0	Doors	Statement in report ER1002.01 (AS350/AS355)	X			
27.807	21	Emergency Exits	Statement in report ER1002.01 (AS350/AS355)		X		Installation does not block doors from opening Bike rack is located aft of cabin doors 12 AUG 2016
27.865	11	External Loads	Analysis in report ER1002.01 (AS350/AS355) and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		
27.1387	7	Position Light System Dihedral Angles	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
27.1401	10	Anticollision Light System	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
Subpart G – Operating Limitations and Information							
27.1505	14	Never Exceed Speed	Flight Test, Flight Manual Supplement FMS1002.91 (AS350/AS355)	X			V _{NE} limits to be determined by flight test
27.1525	21	Kinds of Operation	FMS1002.91 (AS350/AS355)	X			Limited to VFR only, 12 AUG 2016 LOI by TCC A per SOC
27.1529	18	Instructions for Continued Airworthiness	ICA Provided, ICA1002.90	X			
27.1541	0	Markings and Placards - General	Compliance with 27.1557 below	X			Placard is engraved aluminum, installed on bike rack IAW drawings and ICA 12 AUG 2016
27.1557	14	Miscellaneous Markings and Placards	150 lb design cargo load		X		
27.1581	14	Rotorcraft Flight Manual – General	FMS1002.91 (AS350/AS355)	X			Placard installed on bike rack, instructions provided.
27.1583(c)	16	Operating Limitations – Weight and Loading Information	FMS1002.91 (AS350/AS355)	X			
27.1585	21	Operating Procedures	FMS1002.91 (AS350/AS355)	X			
27.1587	21	Performance Information	FMS1002.91 (AS350/AS355)	X			
27.1589	0	Loading Information	FMS1002.91 (AS350/AS355) and Placard	X			

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3

DATE: 29 April 2015
REVISION No. 3, 07 July 2016

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Airbus Helicopters
MODEL: AS350 (all models), AS355 (all models)

REGISTRATION: All Eligible
SERIAL No.: All Eligible

NATURE OF WORK: Quick Release Bike Rack Installation

TYPE CERTIFICATE DATA SHEET: H-83, H-87

MODEL CERTIFICATION BASIS: FAR 27 at Amdt. 27-20, plus select sections of amdt. 27-21 (AS355NP basis of certification)

MODIFICATION CERTIFICATION BASIS: Same as original basis of certification

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart B - Flight							
27.21	21	Proof of Compliance	Flight Test	X			See comments for flight test below
27.29	14	Empty Weight and Corresponding C of G	Data specified on inst'n drawing	X			
27.45	21	Performance - General	Flight Test			X	
27.51	0	Takeoff data: General	Flight Test			X	
27.65	14	Climb: All Engines Operating	Flight Test			X	
27.71	21	Glide Performance	Flight Test			X	
27.73	14	Performance at Min. Operating Speed	Flight Test			X	Preliminary flight tests performed by Aero Design in accordance with Flight Test Plan FTP1002.03 (AS350/AS355)
27.75	0	Landing	Flight Test			X	
27.141	19	Flight Characteristics - General	Flight Test			X	
27.143	21	Controllability and Maneuverability	Flight Test			X	Certification flight tests performed by TCCA test pilot DAR 370 in accordance with Flight Test Plan
27.171	0	Stability - General	Flight Test			X	
27.173	21	Static Longitudinal Stability	Flight Test			X	FTP1002.04(AS350/AS355)
27.175	21	Demonstration of Longitudinal Stability	Flight Test			X	
27.177	21	Static Directional Stability	Flight Test			X	
27.241	0	Ground Resonance	Flight Test			X	
27.251	0	Vibration	Flight Test			X	

X *[Signature]* 12 AUG 2016

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart C – Strength Requirements							
27.301	0	Loads – Air Drag Loads	Analysis in report ER1002.01 (AS350/AS355)	X			
27.301	0	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X		
27.303	0	Factor of Safety	Analysis in report ER1002.01 (AS350/AS355)		X		
27.305	0	Strength and Deformation	Analysis in report ER1002.01 (AS350/AS355)		X		
27.307	3	Proof of Structure	Analysis in report ER1002.01 (AS350/AS355)		X		
27.337(a)	0	Limit Maneuvering Load Factor	and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		Critical load factor in vertical direction.
27.547	3	Main Rotor Structure	Flight Test		X		See comments for flight test above
27.561(b) (3)	0	Occupant Protection	N/A		X		Not an item of mass inside the cabin
27.561(c)	0	Items of Mass	N/A		X		
			Statement in report ER1002.01 (AS350/AS355)				
							12 AUG 2016 Bike racks are outboard of cabin occupants. i.e., bike racks are not located above/behind the cabin. Forward deflection or failure of bike rack poses no threat to occupants of cabin. 27.337 Maneuvering Loads are critical vertical loads.
Subpart D – Design and Construction							
27.601	0	Design	Review and Inspect; functional test in TR1002.02 (AS350/AS355)		X		
27.603	16	Materials	Drawings		X		
27.605	16	Fabrication Methods	Drawings		X		
27.609	0	Protection of Structure	Drawings		X		
27.610(b) (1)	21	Lightning Protection	Statement per section 7.5 - bonded all metal construction, see installation drawings and ICA	X			Bonding, protection and procedures iaw Airbus AMM and SPM.
27.611	0	Inspection Provisions	Drawings		X		Design is easy to inspect.
							12 AUG 2016

Aero Design Ltd. CPR Decision Record		CPR-DR1002, Revision 0, 30 April 2015
CHANGED PRODUCT RULE (CPR) DECISION RECORD		
NAPA No.:		
Step 1: Identify the proposed change to the aeronautical product. (Section 4.1 of AC 500-016)		The changes are detailed in the listed document(s): Certification Plan CP1002, Revision 0.
Note: A G-1 Issue Paper <u>may</u> be required to track/document the decisions at Step 2 and Steps 5 through 8, and to detail the concluded certification basis.		
Step 2: Is the change substantial? (Section 4.2 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	A new type certificate is required. CPR Decision Process is Closed . Proceed to Step 3
Step 3: Will the latest standards be used? (Section 4.3 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Certification basis to use latest standards. Proceed to Step 8 . Proceed to Step 4.
Step 4: Group changes into related and unrelated groupings. (Section 4.4 of AC 500-016)	You may need to define the project in the format of the AC's example for Step 4. Note: For multiple groupings, continuation of this process should be split to separate decision records.	
Step 5: Is the proposed change significant? (Section 5.0 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Proceed to Decision . Compliance may be shown to earlier standards. Certification basis to be defined and documented as indicated (below). Proceed to Step 8 .
Decision: Will the latest standards be used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Certification basis to use latest standards. Proceed to Step 8 . Proceed to Step 6, addressing each area separately (see below).
Identification of Affected Areas:	The area(s) affected by the proposed change have been detailed in Certification Plan document number(s): CP1002, Revision 0 <i>1002 / 15 Jun 2015</i>	
Step 6: Is this area affected by the proposed change? (Ask for each area) (Section 6.1 of AC 500-016)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Proceed to Step 7. Compliance with the latest standards is not required. Compliance may be continued to be shown with the existing certification basis.
Step 7: Do the latest standards contribute materially to the level of safety and are they practical? (Section 6.2 of AC 500-016)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Certification basis to be established using latest standards. Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification Basis defined or documented as indicated in below. Note: Several standards may apply to each area and the assessment may differ from standard to standard. Indicate Yes if compliance with any latest standard(s) will be required. Indicate No only if earlier standards are to be applied.
<input type="checkbox"/> Continuation Sheet(s) Attached		
Note: A delegate may develop a proposal for the Yes/No decision of Step 7. TCCA will make the final determination.		
Step 8: Is the proposed Basis of Certification Adequate? (Section 8.0 of AC 500-016)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Stop! CPR Decision Process is Closed. Determination of Certification Basis is Complete! Basis of certification may require later airworthiness standards or Special Conditions – Consult TCCA.
Certification Basis	The certification basis is as follows or as detailed in the listed document(s): Refer to Certification Plan CP1002	
Under the delegated authority, I have examined the change in type design listed above according to established procedures and hereby determine, to the best of my knowledge and belief, that it is: (check one)		
<input type="checkbox"/> substantial, pursuant to section 521.153 of the CARs <input type="checkbox"/> significant, pursuant to subsection 521.158(3) of the CARs <input checked="" type="checkbox"/> not significant, pursuant to subsection 521.158(3) of the CARs		
<i>James Tinson</i> James Tinson, DAR 304		MAY 12 2015 Date

Wings Project No
WPN 1507

Aero Design Ltd.



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www.aerodesign.ca

FMS1002.91

AIRBUS HELICOPTERS (EUROCOPTER) AS350 & AS355 SERIES

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE BICYCLE RACK MODEL 100201

TCCA Supplemental Type Certificate No. SH16-29

FAA Supplemental Type Certificate No. _____

EASA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory. Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Airbus Helicopters (Eurocopter) AS350 and AS355 Series Helicopters when fitted with the Quick Release Bicycle Rack Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Revision 0
30 June 2016

Page 1

TRANSPORT CANADA APPROVED

RECORD OF REVISIONS

Revision Number	Issue Date	Content Description and Changes
0	30 June 2016	Original Issue

RECORD OF REVISION INSERTION

Revision Number	Issue Date	Date Inserted	By
0	30 June 2016	N/A	Original Issue

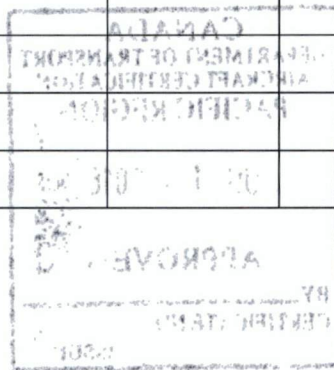


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II Normal Procedures	5
III Emergency Procedures	5
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V Weight and Balance	7
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LIST OF EFFECTIVE PAGES

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Record of Revisions	2	0
TOC, LOEP	3	0
Section I	4	0
Section II, III	5	0
Section IV	6	0
Section V	7-12	0
Section VI	13-16	0

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

I LIMITATIONS

1. Loading

The maximum load on the Aero Design Ltd. Quick Release Bicycle Rack, model 100201, is 50 lbs (22.7 kg) maximum per bicycle, and 150 lb. (68 kg) total per rack.

2. Configuration

- The Quick Release Bicycle Rack may be installed on the left side, right side or both sides.
- Installation of an Aero Design Ltd. Cargo Basket on the right side is **PROHIBITED** when a bicycle rack is installed on the left side.
- Installation of an Aero Design Ltd. Cargo Basket on the left side is permitted when a Bicycle Rack is installed on the right.
- Bicycles may be placed in any combination of positions on the rack with the following exceptions:
 - Two bicycles installed on the right side: installation of bicycles in the inboard and centre positions is **PROHIBITED**.
e.g. One bicycle must be located in the outboard position.
 - Single bicycle installed on the left side: installation in the inboard or outboard position is **PROHIBITED**.
e.g. Bicycle must be located in the centre position.

3. All bicycles installed on the rack:

- Must be mountain bicycles intended for the following categories of riding: cross country, trail riding, all mountain (also referred to as "Enduro"), downhill, freeride or dirt jumping.
- The tire size must be 26 inches (660 mm) minimum to 29 inches (740 mm) maximum, up to 4 inches (100 mm) maximum wide.
- Wheel attachment to bicycle frame:
 - Closed loop attachment – no additional securing straps required.
 - Slotted attachments – an additional ratchet strap or cam strap shall be placed around the the bicycle frame to secure the bicycle to the rack.
- The bicycle must be in serviceable condition.
- The tires must be inflated to the manufacturer's specifications.
- No loose equipment (e.g. water bottles) may be left on the bicycle.

4. Types of operation:
 - Day/Night VFR conditions.
 - AS355 only - Category A operations are **PROHIBITED**.
5. V_{NE} is limited to 105 KIAS (power-on and power-off) with one or two racks installed, empty or loaded, unless the basic flight manual limitations are more restrictive.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all bicycles loaded on the rack are properly secured for flight, including any auxiliary equipment installed on the bicycles.
 - b) Ensure the bicycles are locked in position on the rack. Pull forward and side to side on the bicycle to check.
 - c) Ensure the rack is locked in position on the mounting beams. Pull up on the forward end of the rack to check.

CAUTION:

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the rack.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

1. Hover Performance

Reduce the IGE and OGE Maximum Hover Weight predicted by the performance charts or the VEMD by 100 lbs (45 kg) when one or two bicycle racks are installed.

2. Climb Performance

Reduce the climb performance predicted by the performance charts by the following:

One Bicycle Rack Installed	125 fpm
One Bicycle Rack with Bikes	200 fpm
Left and Right Bicycle Racks Installed	200 fpm
Left and Right Bicycle Racks with Bikes	300 fpm

3. Cruise Performance

- One Bicycle Rack Installed with or without Bicycles:
Cruise Speed is reduced by 10 knots, fuel consumption in cruise flight is 10 percent greater than predicted by the RFM.
- Left and Right Bicycle Racks Installed:
Cruise Speed is reduced by 10 knots, fuel consumption in cruise flight is 10 percent greater than predicted by the RFM.
- Left and Right Bicycle Racks with Bicycles:
Cruise Speed is reduced by 20 knots, fuel consumption in cruise flight is 20 percent greater than predicted by the RFM.

V WEIGHT AND BALANCE

This section contains weight and balance and loading information for bicycle rack model 100201.

The racks are limited to 50 lbs (22.7 kg) per bicycle, 150 lbs (68 kg) total per side. Heavier bicycles should be located on the inboard positions if possible.

Longitudinal moment arms for bicycles are given only for the location of an average bicycle with 26 inch (660 mm) tires. Larger bicycles with larger wheels will shift the CG forward. Due to the length and position of the rack, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

There are three possible configurations of mounting provisions: 78602-01-XX Low Mounted, 78602-02-XX High Mounted, and 78603-01-XX Cargo Pod Compatible. All three locate the rack at the same position longitudinally, but each is different laterally. Ensure the correct mounting configuration is used to determine weight and balance.

1. Bicycles Loaded on Rack

The loading limitations from Section I are repeated below for reference:

- Bicycles may be placed in any combination of positions on the rack with the following exceptions:
 - Two bicycles installed on the right side: installation of bicycles in the inboard and centre positions is **PROHIBITED**.
e.g. One bicycle must be located in the outboard position.
 - Single bicycle installed on the left side: installation in the inboard or outboard position is **PROHIBITED**.
e.g. Bicycle must be located in the centre position.

Standard Units										
Side	Description	Weight	Longitudinal		Lateral (Low Mounted 100201-01)		Lateral (High Mounted 100201-02)		Lateral (Cargo Pod Compatible 100201-03)	
			arm	moment	arm	moment	arm	moment	arm	moment
		lb	in	in-lb	in	in-lb	in	in-lb	in	in-lb
Left	Bicycle – inboard	50.0	161.00	8050.00	-45.80	-2290.0	-45.00	-2250.0	-47.80	-2390.0
	Bicycle – centre	50.0	161.00	8050.00	-53.80	-2690.0	-53.00	-2650.0	-55.80	-2790.0
	Bicycle – outboard	50.0	161.00	8050.00	-61.80	-3090.0	-61.00	-3050.0	-63.80	-3190.0
Right	Bicycle – inboard	50.0	161.00	8050.00	45.80	2290.0	45.00	2250.0	47.80	2390.0
	Bicycle – centre	50.0	161.00	8050.00	53.80	2690.0	53.00	2650.0	55.80	2790.0
	Bicycle – outboard	50.0	161.00	8050.00	61.80	3090.0	61.00	3050.0	63.80	3190.0

Metric Units										
Side	Description	Weight	Longitudinal		Lateral (Low Mounted 100201-01)		Lateral (High Mounted 100201-02)		Lateral (Cargo Pod Compatible 100201-03)	
			arm	moment	arm	moment	arm	moment	arm	moment
		kg	mm	mm-kg	mm	mm-kg	mm	mm-kg	mm	mm-kg
Left	Bicycle – inboard	22.7	4089.4	92746.1	-1162.1	-26354.9	-1143.0	-25922.8	-1214.1	-27535.8
	Bicycle – centre	22.7	4089.4	92746.1	-1365.3	-30963.4	-1346.2	-30531.3	-1417.3	-32144.3
	Bicycle – outboard	22.7	4089.4	92746.1	-1568.5	-35571.9	-1549.4	-25139.8	-1620.5	-36752.8
Right	Bicycle – inboard	22.7	4089.4	92746.1	1162.1	26354.9	1143.0	25922.8	-1214.1	27535.8
	Bicycle – centre	22.7	4089.4	92746.1	1365.3	30963.4	1346.2	30531.3	-1417.3	32144.3
	Bicycle – outboard	22.7	4089.4	92746.1	1568.5	35571.9	1549.4	25139.8	-1620.5	36752.8

2. Configuration 100201-01 – Bicycle Rack on Low Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-01-02	LH Low Mounting Provisions Installation	6.4	135.60	867.50	-37.20	-238.00
100210-01-01	LH Bicycle Rack Assembly	61.8	146.37	9045.67	-53.30	-3293.94
100201-01-01	LH Low Bicycle Rack Installation (total)	68.2	145.35	9913.17	-51.79	-3531.94
78602-01-01	RH Low Mounting Provisions Installation	6.4	135.60	867.50	37.20	238.00
100210-01-02	RH Bicycle Rack Assembly	61.8	146.37	9045.67	53.30	3293.94
100201-01-02	RH Low Bicycle Rack Installation (total)	68.2	145.35	9913.17	51.79	3531.94

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78602-01-02	LH Low Mounting Provisions Installation	2.9	3443.0	9970.6	-944.6	-2735.4
100210-01-01	LH Bicycle Rack Assembly	28.0	3717.8	104217.5	-1353.8	-37950.3
100201-01-01	LH Low Bicycle Rack Installation (total)	30.9	3691.6	114188.1	-1315.3	-40685.7
78602-01-01	RH Low Mounting Provisions Installation	2.9	3443.0	9970.6	944.6	2735.4
100210-01-02	RH Bicycle Rack Assembly	28.0	3717.8	104217.5	1353.8	37950.3
100201-01-02	RH Low Bicycle Rack Installation (total)	30.9	3691.6	114188.1	1315.3	40685.7

3. Configuration 100201-02 – Bicycle Rack on High Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-02-02	LH High Mounting Provisions Installation	6.4	135.60	867.50	-36.50	-233.80
100210-01-01	LH Bicycle Rack Assembly	61.8	146.37	9045.67	-52.53	-3246.35
100201-02-01	LH High Bicycle Rack Installation (total)	68.2	145.35	9913.17	-51.03	-3480.15
78602-02-01	RH High Mounting Provisions Installation	6.4	135.60	867.50	36.50	233.80
100210-01-02	RH Bicycle Rack Assembly	61.8	146.37	9045.67	52.53	3246.35
100201-02-02	RH High Bicycle Rack Installation (total)	68.2	145.35	9913.17	51.03	3480.15

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78602-02-02	LH High Mounting Provisions Installation	2.9	3443.0	9970.6	-928.1	-2687.6
100210-01-01	LH Bicycle Rack Assembly	28.0	3717.8	104217.5	-1334.3	-37402.1
100201-02-01	LH High Bicycle Rack Installation (total)	30.9	3691.6	114188.1	-1296.1	-40089.7
78602-02-01	RH High Mounting Provisions Installation	2.9	3443.0	9970.6	928.1	2687.6
100210-01-02	RH Bicycle Rack Assembly	28.0	3717.8	104217.5	1334.3	37402.1
100201-02-02	RH High Bicycle Rack Installation (total)	30.9	3691.6	114188.1	1296.1	40089.7

4. Configuration 100201-01 – Bicycle Rack on Cargo Pod Compatible Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78603-01-02	LH Cargo Pod Compatible Mounting Provisions Installation	6.8	135.40	921.00	-38.80	-263.60
100210-01-01	LH Bicycle Rack Assembly	61.8	146.37	9045.67	-55.30	-3417.54
100201-03-01	LH Cargo Pod Compatible Bicycle Rack Installation (total)	68.6	145.29	9966.67	-53.66	-3681.14
78603-01-01	RH Cargo Pod Compatible Mounting Provisions Installation	6.8	135.40	921.00	38.80	263.60
100210-01-02	RH Bicycle Rack Assembly	61.8	146.37	9045.67	55.30	3417.54
100201-03-02	RH Cargo Pod Compatible Bicycle Rack Installation (total)	68.6	145.29	9966.67	53.66	3681.14

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78603-01-02	LH Cargo Pod Compatible Mounting Provisions Installation	3.1	3440.1	10584.8	-984.6	-3029.6
100210-01-01	LH Bicycle Rack Assembly	28.0	3717.8	104217.5	-1404.6	-39374.4
100201-03-01	LH Cargo Pod Compatible Bicycle Rack Installation (total)	31.1	3687.6	114802.3	-1362.1	-42404.0
78603-01-01	RH Cargo Pod Compatible Mounting Provisions Installation	3.1	3440.1	10584.8	984.6	3029.6
100210-01-02	RH Bicycle Rack Assembly	28.0	3717.8	104217.5	1404.6	39374.4
100201-03-02	RH Cargo Pod Compatible Bicycle Rack Installation (total)	31.1	3687.6	114802.3	1362.1	42404.0

VI INSTALLATION / REMOVAL INSTRUCTIONS

1. Bicycles on Rack

The racks are designed to accommodate bicycles with 26 – 29 inch (660 – 740 mm) tires, up to 4 inches (100 mm) wide, with sufficient clearance for brakes, drivetrain, and suspension components.

The bicycles are retained by a moveable frame with a cam mechanism that locks down on the tires. The mechanism also locks the frame in position when the rack is not loaded.

CAUTION:

Deflated tires may not be gripped sufficiently to be safely retained in flight.

To provide maximum clearance from the helicopter, the most inboard bicycle shall be loaded with the handle bars aft. It is recommended to load the centre bicycle with the handle bars forward, and the outboard bicycle with the handle bars aft, however orientation of these bicycles is not mandatory and they shall be loaded as required to allow clearance from the airframe and between the pedals, gears, suspension and other components of adjacent bikes.

CAUTION:

Some loading combinations may require adapting the bicycle to fit, such as changing the height of or removing the seat or rotating the handle bars. Ensure all components are secured prior to flight.

A. Loading - Refer to Figure 1.

1. Set bicycle on rack. Slide bicycle aft forcefully to seat tire in aft fixed frame.
2. Slide moving frame aft forcefully to seat frame against tire. Push on lower part of frame for easiest movement.
3. Rotate lever on cam mechanism up to clamp frame into bicycle. Lever will snap into locked position.
4. For bicycles with slotted wheel attachments only: secure bicycle to rack with an additional ratchet strap or cam strap through the frame of the bicycle at the pedal crank intersection.
5. Check bicycle is tightly retained by pulling side to side. Some movement is expected, the bicycle tires must not shift or come loose in the frames.

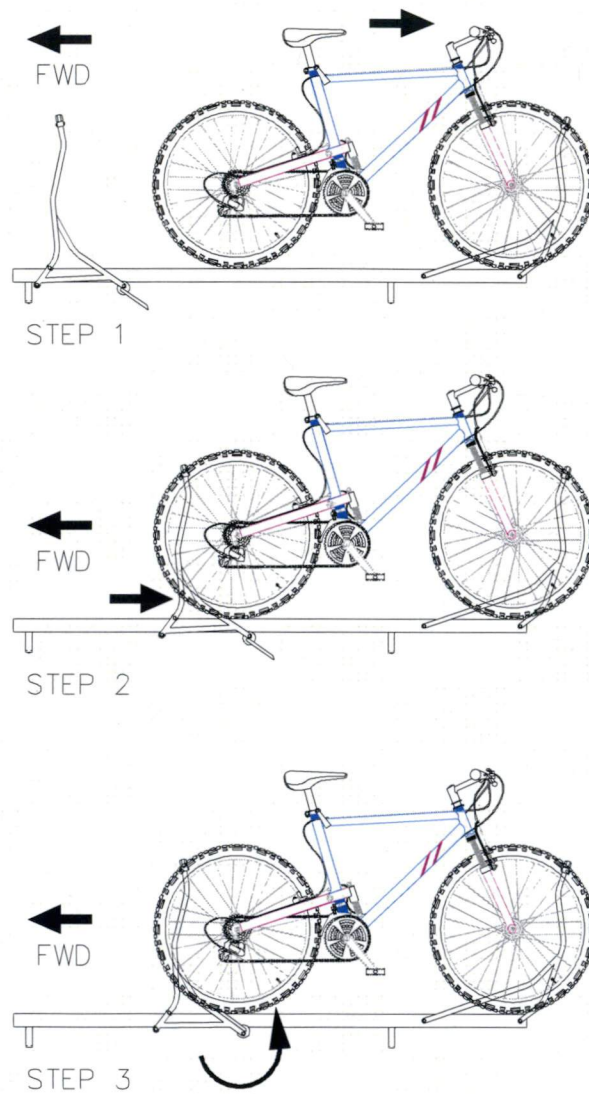


Figure 1 – Bicycle loading
(unloading is reverse)

B. Unloading - Refer to Figure 1.

1. Remove ratchet strap or cam strap.
2. Unlock cam on forward moving frame by rotating lever down to open position.
3. Slide moving frame forward. Pull on lower part of frame for easiest movement.
4. Pull bicycle forward to unseat from aft frame. Remove bicycle.

2. Bicycle Rack Assembly

The mounting beams are installed in accordance with drawing 78602 or 78603. The bicycle rack(s) is installed in accordance with drawing 100201. Logbook entry indicating installation or removal of bicycle rack and which weight and balance amendment is in effect is required when a bicycle rack is installed or removed.

A. Installation - Refer to Figure 2.

1. At aft mounting beam, slide rack attachment fittings into keyways on mounting beam.
2. At forward mounting beam, slide rack aft and lift rack until attachment fitting hits stop over keyway. Push fittings into keyways and slide rack down until locked.

B. Removal - Refer to Figure 2.

1. Pull knob at bottom end of forward beam and lift forward end of rack until attachment fittings are free of keyways.
2. Slide rack forward until aft attachment fittings are free of keyways and remove from helicopter.

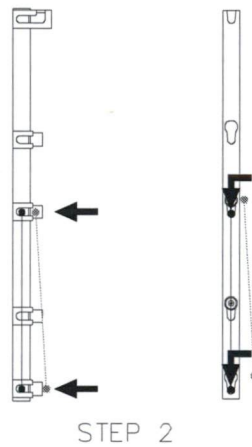
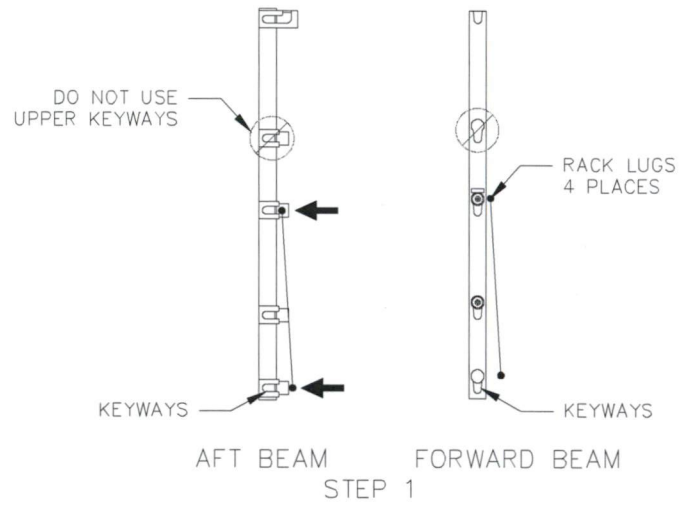




Figure 2 – Rack Attachment Steps

DOCUMENT CONTROL LIST

(Listing of Current Approved and Accepted Documents)

DCL REV.	DOCUMENT NO.	DOC REV.	DOC REV. DATE	DOCUMENT CONTENT
APPROVAL DOCUMENT				
0	SH16-29	1	15/08/2016	TCCA STC Approval, approval date 15/08/2016
DOCUMENTS SITED ON THE APPROVAL DOCUMENT				
0	100201	0	07/07/2016	Quick Release Bicycle Rack Installation
0	ICA1002.90	0	12/07/2016	Instructions for Continued Airworthiness
0	FMS1002.91	0	30/06/2016	Flight Manual Supplement
FABRICATION AND OTHER DOCUMENTS				
0	DCL1002-11	0	12/08/2016	Document Control List for Quick Release Bicycle Rack Assembly

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	12/08/2016	Jeff Clarke	TCCA - Pacific	Original

<p>APPROVAL:</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>CANADA DEPARTMENT OF TRANSPORT AIRCRAFT CERTIFICATION PACIFIC REGION</p> <p>AUG 15 2016</p> <p>APPROVED BY  CERTIFICATE NO. SH16-29 ISSUE 1</p> </div>	<div style="text-align: center;">  <p>Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</p> </div> <hr/> <p style="text-align: center;">Airbus Helicopters (Eurocopter) AS350 & AS355 Series Quick Release Bicycle Rack Installation</p> <table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Document Control List Number</td> <td style="text-align: center;">Revision</td> <td style="text-align: center;">Sheet</td> </tr> <tr> <td style="text-align: center; font-size: 24pt;">DCL1002-1</td> <td style="text-align: center; font-size: 24pt;">0</td> <td style="text-align: center; font-size: 24pt;">1 of 1</td> </tr> </table>	Document Control List Number	Revision	Sheet	DCL1002-1	0	1 of 1
Document Control List Number	Revision	Sheet					
DCL1002-1	0	1 of 1					

DOCUMENT CONTROL LIST

(The Current Approval/Configuration Control List for Fabricated Parts, Assemblies and Other Documents and a Complete Listing of the Applicable Design Compliance Documents)

DCL REV.	DOCUMENT NO.	DOC REV.	DOC REV. DATE	DOCUMENT CONTENT
FABRICATION AND ASSEMBLY DOCUMENTS				
0	100210	0	30/06/2016	Bicycle Rack Assembly
0	100215	0	13/06/2016	Rack Base Fabrication
0	100220	0	13/06/2016	Moving Frame Fabrication
0	100221	0	14/06/2016	Fixed Frame Fabrication
0	100222	0	29/06/2016	Cam Fabrication
0	100223	0	04/09/2015	Roller Fabrication
0	100224	0	30/06/2016	Bushing Fabrication
0	100225	0	13/06/2016	Strap Fabrication
0	100226	0	15/06/2015	Threaded Bushing Fabrication
0	100227	0	29/06/2016	Placard
0	100230	0	13/06/2016	Beam

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	12/08/2016	Jeff Clarke	TCCA - Pacific	Original

APPROVAL:



Aero Design Ltd.

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3
Tel: 604.483.2376 www.aerodesign.ca

Airbus Helicopters (Eurocopter)

AS350 & AS355 Series

Quick Release Bicycle Rack Assembly

Document Control List Number

Revision

Sheet

DCL1002-11

0

1 of 2

DOCUMENT CONTROL LIST

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Document Control List Number	Revision	Sheet
DCL1002-11	0	2 of 2



Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC
Canada V8A 0G3

Number: SH16-29

Issue No.: 1

Approval Date: August 15, 2016

Issue Date: August 15, 2016

Responsible Office:

Pacific

Aircraft/Engine Type or Model:

Airbus Helicopters AS350 B, B1, B2, B3, BA, D
Eurocopter AS355 E, F, F1, F2, N, NP

Registration/Serial No.:

All eligible

Canadian Type Certificate or Equivalent:

H-83 (AS350 series), H-87 (AS355 Series)

Description of Type Design Change:

Installation of Quick Release Bicycle Racks

Installation/Operating Data, Required Equipment and Limitations:

Quick Release Bicycle Racks shall be installed in accordance with (iaw) Aero Design Ltd. Document Control List, DCL1002-1, Revision 0, dated 12 August 2016, or later TCCA approved revision.

Required Equipment: Installation of External Attachment Provisions iaw STC SH08-16, Configuration A, is a prerequisite for installation of the Quick Release Bicycle Racks.

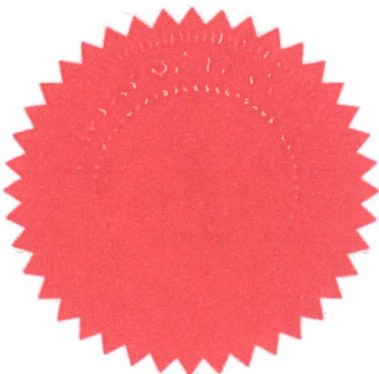
Modified rotorcraft shall be operated iaw Aero Design Ltd. Flight Manual Supplement FMS1002.91, Revision 0, dated 30 June 2016, or later TCCA approved revision.

Modified rotorcraft shall be maintained iaw Aero Design Ltd. Instructions for Continued Airworthiness ICA1002.90, Revision 0, dated 12 July 2016, or later TCCA accepted revision.

Basis of certification remains as defined in the applicable Type Certificate Data Sheets.

— End —

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



Michael Chan
For Minister of Transport


Canada

DOCUMENT CONTROL LIST

(Listing of Current Approved and Accepted Documents)

DCL REV.	DOCUMENT NO.	DOC REV.	DOC REV. DATE	DOCUMENT CONTENT
APPROVAL DOCUMENT				
0	SH16-29	1	15/08/2016	TCCA STC Approval, approval date 15/08/2016
DOCUMENTS SITED ON THE APPROVAL DOCUMENT				
0	100201	0	07/07/2016	Quick Release Bicycle Rack Installation
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0	FMS1002.91	0	30/06/2016	Flight Manual Supplement
FABRICATION AND OTHER DOCUMENTS				
0	DCL1002-11	0	12/08/2016	Document Control List for Quick Release Bicycle Rack Assembly

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	12/08/2016	Jeff Clarke	TCCA - Pacific	Original

<p>APPROVAL:</p> <p>CANADA DEPARTMENT OF TRANSPORT AIRCRAFT CERTIFICATION PACIFIC REGION</p> <p>AUG 15 2016</p> <p>APPROVED BY <i>[Signature]</i></p> <p>CERTIFICATE NO. <i>SH16-29</i></p> <p>ISSUE</p>	<p> Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</p>		
	<p>Airbus Helicopters (Eurocopter) AS350 & AS355 Series Quick Release Bicycle Rack Installation</p>		
	<p>Document Control List Number</p> <p>DCL1002-1</p>	<p>Revision</p> <p>0</p>	<p>Sheet</p> <p>1 of 1</p>

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0	100226	0	15/06/2015	Threaded Bushing Fabrication
0	100227	0	29/06/2016	Placard
0	100230	0	13/06/2016	Beam

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	12/08/2016	Jeff Clarke	TCCA - Pacific	Original

APPROVAL: 		 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca	
Airbus Helicopters (Eurocopter) AS350 & AS355 Series Quick Release Bicycle Rack Assembly			
Document Control List Number DCL1002-11		Revision 0	Sheet 1 of 2

DOCUMENT CONTROL LIST

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Document Control List Number	Revision	Sheet
DCL1002-11	0	2 of 2

**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
ICA 1002.90**

Revision 0
Date: 12 July 2016

AIRBUS HELICOPTERS AS350 & AS355 SERIES

QUICK RELEASE BICYCLE RACK

TCCA Supplemental Type Certificate No. SH16-29
FAA Supplemental Type Certificate No. _____
EASA Supplemental Type Certificate No. _____

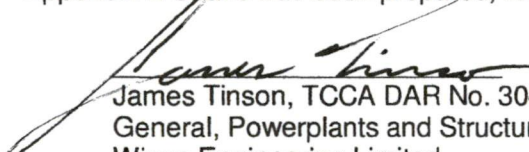
GENERAL NOTES

1. Compliance with Chapter 4 – Airworthiness Limitations Section is **mandatory**.
2. Chapter 4 – Airworthiness Limitations Section is approved by the Minister.
3. The information and data contained in this document supersede or supplement that contained in the applicable Airbus Helicopters manuals for the AS350 and AS355 series only to the extent noted herein.
4. This ICA must be logged and inserted in the aircraft's Maintenance Manual and/or incorporated into the aircraft's maintenance/inspection program.

REVIEWED AND ACCEPTED

The applicable compliance criteria is; CFR Part 27, Subpart G, Section 27.1529 at Amdt 27-18 in accordance with Appendix A to Part 27.

A Statement of Compliance Check Sheet per Transport Canada Civil Aviation MSI 53-R2, Appendix A-3, and has been prepared, reviewed and accepted by:


James Tinson, TCCA DAR No. 304
General, Powerplants and Structures
Wings Engineering Limited

Date: 18 JUL 2016

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3
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Notice:





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7.12 Schedule

The following schedule is proposed and will be updated as items are changed or completed.

Proposed target completion date: ASAP

7.12.1 Airbus Helicopters AS350 / AS355

Item	Deliverable	TCCA Level of Involvement / Service	Submission Date (proposed)	Approval / Acceptance (Initial)	Date
Certification Plan	CP1002	Accept certification plan	20/04/2016	TCCA –Pac M.C. (Rev. 2)	04/03/2016
Flight test plan (Section 7.2.5)	FTP1002.03	Accept test plan	26/05/2016	N/A – company R&D	
Flight test plan (Section 7.2.5)	FTP1002.04	Accept test plan	16/05/2016	TCCA-HQ T.B.	30/05/2016
Engineering Report – Air Drag Loads (Section 7.3.5)	ER1002.01	Accept air drag loads	11/04/2016	TCCA –Pac M.C.	19/04/2016
Engineering Report (Section 7.7.5, 7.9.5)	ER1002.01	Finding of compliance to FAR 27.783, .1387, .1401	11/04/2016		15/08/2016
Flight Manual Supplement (Section 7.10.5)	FMS1002.91	Review and approval	18/07/2016		15/08/2016
ICA (Section 7.11.5) (MSI 53)	ICA1002.90	Review and acceptance	19/07/2016		15/08/2016
Findings of Compliance (Section 7.2.5, 7.3.5, 7.5.5, 7.7.5, 7.9.5, 7.10.5)	CP1002 (checklist)	Finding of compliance to indicated paragraphs on compliance program checklist (Appendix A)	05/07/2016		15/08/2016

8.0 SI 521-005 – SECTION 9.2 – AML STC CONSIDERATIONS

The bicycle rack installations are to be applied to multiple models of aircraft on separate type certificates. SI 521-005 section 9.2 and Appendix H specify the instructions to be followed for issuance of an AML STC.

The type certificates for each model are listed in section 5.1. The bicycle rack configuration installed on the AS350 and AS355 models is identical, but each model is on a separate type certificate. The aircraft are identical in the area of this modification.

(1) An Approved Model List (AML) process may be appropriate to approve the installation of a change on more than one type-certificated product, provided:

(a) the installation instructions for the change on each type-certificated product are specific and objective;

Installation drawing 100201 applies to AS350 and AS355 models.

(b) the evaluation of the effect of the change applies to all type-certificated products addressed by the approval; and

Evaluation of the changes to the AS350 and AS355 are identical.

(c) demonstrations of compliance, substantiating data and necessary type design data for each of the models listed on the AML STC is provided.

Demonstrations of compliance, substantiating data and type design data are listed on Document Control Lists:

DCL1002-1 and DCL1002-11 for AS350 and AS355 models

(2) An AML STC is an STC covering several aeronautical products of differing types or models, approved under separate type certificates within the same AWM Chapter and as such shall only be issued by TCCA.

STC is to be issued by TCCA.

(3) An AML STC may only be issued for aircraft makes and models of a single type i.e. same or comparable design standards. For example, an AML STC may not include aircraft certified against the standards of Chapters 523 and 525 of the AWM on the same certificate.

AS350 and AS355 models are certified to the standards of FAR 27. AS355NP is not eligible for category A operations with the bicycle rack installed, making the FAR 29 paragraphs of the basis of certification not applicable to this installation.

(4) If the modification is significant under CPR then an AML cannot be used, or if the modification is significant for a particular type, then it should be separated off to its own STC.

The modification is not significant for any model, see section 5.5.

(5) Additional guidance on AML STCs is provided in Appendix H of this SI.

Appendix H has been demonstrated above. The same FMS is applicable to the AS350 and AS355 (paragraph 8). ICA are provided, which address all models (paragraph 10).

APPENDIX A

COMPLIANCE PROGRAM CHECKLIST –

AIRBUS HELICOPTERS AS350, AS355

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3

DATE: 29 April 2015
REVISION No. 3, 07 July 2016

MAKE: Airbus Helicopters
MODEL: AS350 (all models), AS355 (all models)

CORRESPONDANCE TO:
(If other than applicant)


REGISTRATION: All Eligible
SERIAL No.: All Eligible

NATURE OF WORK: Quick Release Bike Rack Installation

TYPE CERTIFICATE DATA SHEET: H-83, H-87

MODEL CERTIFICATION BASIS: FAR 27 at Amdt. 27-20, plus select sections of amdt. 27-21 (AS355NP basis of certification)

MODIFICATION CERTIFICATION BASIS: Same as original basis of certification

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart B - Flight							
27.21	21	Proof of Compliance	Flight Test				See comments for flight test below
27.29	14	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X		
27.45	21	Performance - General	Flight Test			X	
27.51	0	Takeoff data: General	Flight Test			X	
27.65	14	Climb: All Engines Operating	Flight Test			X	
27.71	21	Glide Performance	Flight Test			X	
27.73	14	Performance at Min. Operating Speed	Flight Test			X	Preliminary flight tests performed by Aero Design in accordance with Flight Test Plan FTP1002.03 (AS350/AS355)
27.75	0	Landing	Flight Test			X	
27.141	19	Flight Characteristics - General	Flight Test			X	
27.143	21	Controllability and Maneuverability	Flight Test			X	Certification flight tests performed by TCCA test pilot DAR 370 in accordance with Flight Test Plan
27.171	0	Stability - General	Flight Test			X	FTP1002.04(AS350/AS355)
27.173	21	Static Longitudinal Stability	Flight Test			X	
27.175	21	Demonstration of Longitudinal Stability	Flight Test			X	
27.177	21	Static Directional Stability	Flight Test			X	
27.241	0	Ground Resonance	Flight Test			X	
27.251	0	Vibration	Flight Test			X	

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart C – Strength Requirements							
27.301	0	Loads – Air Drag Loads	Analysis in report ER1002.01 (AS350/AS355) <i>Chae</i> X				
27.301	0	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X		
27.303	0	Factor of Safety	Analysis in report ER1002.01 (AS350/AS355)		X		
27.305	0	Strength and Deformation	Analysis in report ER1002.01 (AS350/AS355)		X		
27.307	3	Proof of Structure			X		
27.337(a)	0	Limit Maneuvering Load Factor	and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		Critical load factor in vertical direction.
27.547	3	Main Rotor Structure	Flight Test			X	See comments for flight test above
27.561(b) (3)	0	Occupant Protection	N/A		X		Not an item of mass inside the cabin
27.561(c)	0	Items of Mass	N/A		X		Bike racks are outboard of cabin occupants. i.e., bike racks are not located above/behind the cabin.
			Statement in report ER1002.01 (AS350/AS355)				Forward deflection or failure of bike rack poses no threat to occupants of cabin.
							27.337 Maneuvering Loads are critical vertical loads.
Subpart D – Design and Construction							
27.601	0	Design	Review and Inspect; functional test in TR1002.02 (AS350/AS355)		X		
27.603	16	Materials	Drawings		X		Materials as specified in AR-MMPDS-01
27.605	16	Fabrication Methods	Drawings		X		Design is conventional.
27.609	0	Protection of Structure	Drawings		X		
27.610(b) (1)	21	Lightning Protection	Statement per section 7.5 - bonded all metal construction, see installation drawings and ICA <i>Chae</i> X				Bonding, protection and procedures iaw Airbus AMM and SPM.
27.611	0	Inspection Provisions	Drawings		X		Design is easy to inspect.

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
27.613	16	Material Strength Properties and Design Values	Values used as per AR-MMPDS-01		X		
27.625	0	Fitting Factor	Analysis		X		
27.783	0	Doors	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval
27.807	21	Emergency Exits	Statement in report ER1002.01 (AS350/AS355)		X		Installation does not block doors from opening Bike rack is located aft of cabin doors
27.865	11	External Loads	Analysis in report ER1002.01 (AS350/AS355) and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		
27.1387	7	Position Light System Dihedral Angles	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
27.1401	10	Anticollision Light System	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
Subpart G – Operating Limitations and Information							
27.1505	14	Never Exceed Speed	Flight Test, Flight Manual Supplement FMS1002.91 (AS350/AS355)	X			V _{NE} limits to be determined by flight test
27.1525	21	Kinds of Operation	FMS1002.91 (AS350/AS355)	X			Limited to VFR only.
27.1529	18	Instructions for Continued Airworthiness	ICA Provided, ICA1002.90		X		
27.1541	0	Markings and Placards - General	Compliance with 27.1557 below	X			Placard is engraved aluminum, installed on bike rack IAW drawings and ICA
27.1557	14	Miscellaneous Markings and Placards	150 lb design cargo load		X		
27.1581	14	Rotorcraft Flight Manual – General	FMS1002.91 (AS350/AS355)	X			
27.1583(c)	16	Operating Limitations – Weight and Loading Information	FMS1002.91 (AS350/AS355)	X			
27.1585	21	Operating Procedures	FMS1002.91 (AS350/AS355)	X			
27.1587	21	Performance Information	FMS1002.91 (AS350/AS355)	X			
27.1589	0	Loading Information	FMS1002.91 (AS350/AS355) and Placard	X			Placard installed on bike rack, instructions provided.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
AWM 527 Requirements							
527.1581 (e)	3	Flight Manual – Metric Units	FMS1002.91 (AS350/AS355)	X			Metric units provided



APPENDIX B

CHANGED PRODUCT RULE DECISION RECORD

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3

DATE: 29 April 2015
REVISION No. 3, 07 July 2016

MAKE: Airbus Helicopters
MODEL: AS350 (all models), AS355 (all models)

CORRESPONDANCE TO:
(If other than applicant)

REGISTRATION: All Eligible
SERIAL No.: All Eligible

NATURE OF WORK: Quick Release Bike Rack Installation

TYPE CERTIFICATE DATA SHEET: H-83, H-87

MODEL CERTIFICATION BASIS: FAR 27 at Amdt. 27-20, plus select sections of amdt. 27-21 (AS355NP basis of certification)

MODIFICATION CERTIFICATION BASIS: Same as original basis of certification

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart B - Flight							
27.21	21	Proof of Compliance	Flight Test	X			See comments for flight test below
27.29	14	Empty Weight and Corresponding C of G	Data specified on inst'n drawing				
27.45	21	Performance - General	Flight Test			X	
27.51	0	Takeoff data: General	Flight Test			X	
27.65	14	Climb: All Engines Operating	Flight Test			X	
27.71	21	Glide Performance	Flight Test			X	
27.73	14	Performance at Min. Operating Speed	Flight Test			X	
27.75	0	Landing	Flight Test			X	
27.141	19	Flight Characteristics - General	Flight Test			X	
27.143	21	Controllability and Maneuverability	Flight Test			X	
27.171	0	Stability - General	Flight Test			X	
27.173	21	Static Longitudinal Stability	Flight Test			X	
27.175	21	Demonstration of Longitudinal Stability	Flight Test			X	
27.177	21	Static Directional Stability	Flight Test			X	
27.241	0	Ground Resonance	Flight Test			X	
27.251	0	Vibration	Flight Test			X	

X *[Signature]* 12 AUG 2016

Preliminary flight tests performed by Aero Design in accordance with Flight Test Plan FTP1002.03 (AS350/AS355)

Certification flight tests performed by TCCA test pilot DAR 370 in accordance with Flight Test Plan FTP1002.04(AS350/AS355)

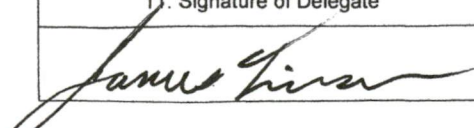
Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
Subpart C – Strength Requirements							
27.301	0	Loads – Air Drag Loads	Analysis in report ER1002.01 (AS350/AS355)	X			
27.301	0	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X		
27.303	0	Factor of Safety	Analysis in report ER1002.01 (AS350/AS355)		X		
27.305	0	Strength and Deformation	Analysis in report ER1002.01 (AS350/AS355)		X		
27.307	3	Proof of Structure			X		
27.337(a)	0	Limit Maneuvering Load Factor	and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		Critical load factor in vertical direction.
27.547	3	Main Rotor Structure	Flight Test		X		See comments for flight test above
27.561(b)(3)	0	Occupant Protection	N/A		X		Not an item of mass inside the cabin
27.561(c)	0	Items of Mass	N/A		X		
			Statement in report ER1002.01 (AS350/AS355)				12 AUG 2016 Bike racks are outboard of cabin occupants. i.e., bike racks are not located above/behind the cabin. Forward deflection or failure of bike rack poses no threat to occupants of cabin. 27.337 Maneuvering Loads are critical vertical loads.
Subpart D – Design and Construction							
27.601	0	Design	Review and Inspect; functional test in TR1002.02 (AS350/AS355)		X		
27.603	16	Materials	Drawings		X		12 AUG 2016 Materials as specified in AR-MMPDS-01
27.605	16	Fabrication Methods	Drawings		X		Design is conventional.
27.609	0	Protection of Structure	Drawings		X		
27.610(b)(1)	21	Lightning Protection	Statement per section 7.5 - bonded all metal construction, see installation drawings and ICA	X			Bonding, protection and procedures iaw Airbus AMM and SPM.
27.611	0	Inspection Provisions	Drawings		X		Design is easy to inspect. 12 AUG 2016

Airworthiness Requirement	FAR 27 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	TCC A	DAR 304	DAR 370	Comments
27.613	16	Material Strength Properties and Design Values	Values used as per AR-MMPDS-01		X		12 AUG 2016
27.625	0	Fitting Factor	Analysis		X		
27.783	0	Doors	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval
27.807	21	Emergency Exits	Statement in report ER1002.01 (AS350/AS355)		X		Installation does not block doors from opening Bike rack is located aft of cabin doors 12 AUG 2016
27.865	11	External Loads	Analysis in report ER1002.01 (AS350/AS355) and Test iaw Test Plan TR1002.02 (AS350/AS355)		X		
27.1387	7	Position Light System Dihedral Angles	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
27.1401	10	Anticollision Light System	Statement in report ER1002.01 (AS350/AS355)	X			No change from Type Approval.
Subpart G – Operating Limitations and Information							
27.1505	14	Never Exceed Speed	Flight Test, Flight Manual Supplement FMS1002.91 (AS350/AS355)	X			V _{NE} limits to be determined by flight test
27.1525	21	Kinds of Operation	FMS1002.91 (AS350/AS355)	X			Limited to VFR only, 12 AUG 2016 LOI by TCCA per SOG
27.1529	18	Instructions for Continued Airworthiness	ICA Provided, ICA1002.90		X		
27.1541	0	Markings and Placards - General	Compliance with 27.1557 below	X			Placard is engraved aluminum, installed on bike rack IAW drawings and ICA
27.1557	14	Miscellaneous Markings and Placards	150 lb design cargo load		X		12 AUG 2016
27.1581	14	Rotorcraft Flight Manual – General	FMS1002.91 (AS350/AS355)	X			
27.1583(c)	16	Operating Limitations – Weight and Loading Information	FMS1002.91 (AS350/AS355)	X			
27.1585	21	Operating Procedures	FMS1002.91 (AS350/AS355)	X			
27.1587	21	Performance Information	FMS1002.91 (AS350/AS355)	X			
27.1589	0	Loading Information	FMS1002.91 (AS350/AS355) and Placard	X			Placard installed on bike rack, instructions provided.



**MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE
WITH THE CERTIFICATION BASIS**

**DÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ
AVEC LA BASE DE CERTIFICATION**

1. Reference Number NAPA File: P-15-0157 Aero Design Ltd. Project No.: 1002 Wings Engineering Project No.: WPN1507		2. Applicant Name Aero Design Ltd.	
Part 1: Identification of Aeronautical Product			
3. Applicable Design Approval Document No. TCCA TCDS No.: H-83, H-87			
4. Model AS350, AS355 Series		5. Make Airbus Helicopters (Eurocopter)	
6. Type (Aircraft, engine, propeller, appliance, part) Helicopter			
Part 2: Substantiating Reports and Data			
7. Number See continuation sheets.		8. Title See continuation sheets.	
9. Purpose of Finding Compliance New STC approval number SH16-29, Issue 1 IAW TCCA accepted Aero Design Ltd. Certification Plan CP1002, Revision 3, 07 July 2016: Installation of Quick Release Bicycle Racks AC and SI 521-005, Phase III - Demonstrate and Record Compliance with the certification basis per CP1002-3. <ul style="list-style-type: none">Installation of Quick Release Bicycle Racks on existing mounting provisions installed in accordance with TCCA STC SH08-16.			
10. Applicable Elements of Certification Basis See Certification Plan CP1002, Revision 3 Appendix A, Compliance Program Checklist: <ul style="list-style-type: none">DAR 304 has addressed FoC requirements wrt the bicycle rack installation for the DCL drawings and reports noted per box 7 and 8.Certification test flights completed by DAR 370 on 15 and 16 June 2016, documented in FTP1002.04TCCA has approved or accepted documents as noted in CP1002, Rev. 3<ul style="list-style-type: none">FMS1002.91, Revision 0 is approved by TCCA.ICA1002.90, Revision 0 was LOI accepted (iaw SI 500-003-02 and CP1002-3) per AD discussions with TCCA-OPI and MSI 53 accepted by DAR 304.			
Part 3: Ministerial Delegate Finding of Compliance with the Certification Basis			
Under the authority vested in me by the Minister under subsection 4.3(1) of the Aeronautics Act, I hereby find that the type design of the aeronautical product is in compliance with the certification basis as demonstrated by the applicant's substantiating reports and data to the best of my knowledge.			
11. Signature of Delegate 	12. Name James Tinson	13. Delegate No. DAR 304	14. Date (yyyy-mm-dd) 2016-08-12



**MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE
WITH THE CERTIFICATION BASIS**

**DÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ
AVEC LA BASE DE CERTIFICATION**


7. Number (continued from sheet 1)	Rev, Date	8. Title (continued from sheet 1)
DCL1002-1	0, 28 July 2016	Document Control List – Bicycle Rack Installation, items below:
100201	0, 07 July 2016	Bicycle Rack Installation
ICA1002.90	0, 12 July 2016	Instructions for Continued Airworthiness
DCL1002-11	0, 28 July 2016	Document Control List – Bicycle Rack Fabrication, items below:
100210	0, 30 June 2016	Bicycle Rack Assembly
100215	0, 13 June 2016	Rack Base Fabrication
100220	0, 13 June 2016	Moving Frame Fabrication
100221	0, 14 June 2016	Fixed Frame Fabrication
100222	0, 29 June 2016	Cam Fabrication
100223	0, 04 Sept 2015	Roller Fabrication
100224	0, 30 June 2016	Bushing Fabrication
100225	0, 13 June 2016	Strap Fabrication
100226	0, 15 June 2015	Threaded Bushing Fabrication
100227	0, 29 June 2016	Placard
100230	0, 13 June 2016	Beam
ER1002.01	1, 08 April 2016	Engineering Report
MSI-53-A3	0, 18 July 2016	Signed Check Sheets for ICA1002.90-0
TR1002.01	1, 24 May 2016	Load Test Report
Documents listed below this line (if any) are approved TCCA or another Delegate:		
FMS1002.91	0, 30 June 2016	Flight Manual Supplement
FTP1002.03	0, 20 May 2016	Flight Test Plan and Report – Company
FTP1002.04	0, 27 June 2016	Flight Test Plan and Report – Certification



DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the Quick Release Bicycle Rack Installation, as detailed in the data approved by Transport Canada on approval SH16-29, Issue 1, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file P-15-0157 as shown; per the TCCA accepted Certification Plan CP1002, Revision 3.

Aero Design Ltd.

per: 
Signature

Jeff Clarke

Print Name

Vice President

Title

12 August 2016

Date



SIGNED UNDERTAKING

In accordance with CAR 521, Aero Design Ltd. hereby undertake to carry out the responsibilities of a design approval document holder, as set out in Division VIII of Part V, Subpart 21 of the CARs, regarding:

1. Technical capability,
2. Service difficulty reporting,
3. Establishing a service difficult reporting system,
4. Investigation of service difficulty reports,
5. Mandatory changes,
6. Transfers,
7. Record keeping and loss or disposal of records,
8. Manuals,
9. Instructions for continued airworthiness, and
10. Supplemental integrity instructions

X


Signature of Holder's authorized person:12 August 2016

Date:

Vice President

Position / Title:

Note: This signed undertaking applies to all design approval documents for which Aero Design Ltd. is the document holder. A copy of this signed undertaking will be provided for any approval issued subsequent to the date of this signed undertaking where Aero Design Ltd. is the holder of the design approval document.

**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
ICA 1002.90**

Revision 0
Date: 12 July 2016

AIRBUS HELICOPTERS AS350 & AS355 SERIES

QUICK RELEASE BICYCLE RACK

TCCA Supplemental Type Certificate No. SH16-29
FAA Supplemental Type Certificate No. _____
EASA Supplemental Type Certificate No. _____


GENERAL NOTES

1. Compliance with Chapter 4 – Airworthiness Limitations Section is **mandatory**.
2. Chapter 4 – Airworthiness Limitations Section is approved by the Minister.
3. The information and data contained in this document supersede or supplement that contained in the applicable Airbus Helicopters manuals for the AS350 and AS355 series only to the extent noted herein.
4. This ICA must be logged and inserted in the aircraft's Maintenance Manual and/or incorporated into the aircraft's maintenance/inspection program per current Q/A procedures.

REVIEWED AND ACCEPTED

The applicable compliance criteria is; CFR Part 27, Subpart G, Section 27.1529 at Amdt 27-18 in accordance with Appendix A to Part 27.

A Statement of Compliance Check Sheet per Transport Canada Civil Aviation MSI 53-R2, Appendix A-3, and has been prepared, reviewed and accepted by:


James Tinson, TCCA DAR No. 304
General, Powerplants and Structures
Wings Engineering Limited

Date; 18 JUL 2016

Aero Design Ltd.



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MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Bicycle Rack on Airbus Helicopters (Eurocopter) AS350 & AS355 Series
Certification Basis of design change and revision date:	FAR 27, Amendment 27-20
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 1002.90, Rev. 0)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 100201

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Eurocopter AS350/AS355 Maintenance Manual	Supplemental ICA ref: Single Manual (ICA1002.90, Rev. 0)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Eurocopter AS350/AS355 Maintenance Manual	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Eurocopter Description and Operation Manual	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Eurocopter Description and Operation Manual	Supplemental ICA ref: Section 0-5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: Eurocopter Description and Operation Manual	Supplemental ICA ref: Section 25-1 includes the bicycle loading and unloading operations as noted in FMS1002.91
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Eurocopter AS350/AS355 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Eurocopter AS350/AS355 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Eurocopter AS350/AS355 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-2 thru 25-5
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Eurocopter AS350/AS355 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-7
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Eurocopter AS350/AS355 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Eurocopter Standard Practices Manual, Chapter 20	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Eurocopter Standard Practices Manual, Chapter 20	Supplemental ICA ref: Section 25-5 for rack assembly; all others Section 25-8
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: Eurocopter Tools Catalog	Supplemental ICA ref: N/A
A527.3(h) Repair Instructions [Added by DAR] (h) Rework limits and repairs.	ICA ref: Eurocopter AMMs and MRRs	Supplemental ICA ref: Section 5-2 Damage Limits are applicable to "minor" type damage limits as agreed to by Aero Design and DAR 304 where these limits are based on Aero Design's service support experience and the DAR's engineering evaluation. i.e.; any damage beyond the limits noted will require repair-by-replacement and/or the parts returned to Aero Design for a repair assessment or replacement. Welding repair processes are iaw the "approved" fabrication drawings.

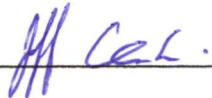
MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3


Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Eurocopter AS350/AS355 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4 "No additional airworthiness limitations have been imposed due to the installation of the Quick Release Bicycle Rack."
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BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.	
Applicants Signature: 	Date: 12 July 2016
Applicants Name: Jeff Clarke, Vice President - Aero Design Ltd.	

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.			
Reviewer's Name: James Tinson	Phone # 604-418-8955	Email: jim@wingsengineering.ca	Mail Routing Symbol: N/A
Signature: 	Date: 18 JUL 2016	NAPA Number: P-15-0157	

DAR 304

Appliance and Part Identification

201.10 (1) Subject to subsections (4) and (5), the manufacturer of an appliance or a part — including a part approved through the issuance of a part design approval — shall place on it, in the manner specified in subsection 201.05(2), the following identification information:

- ✓ (a) the name, trademark or symbol identifying the manufacturer and, if the manufacturer is an entity, its legal name;
- (b) the manufacturer's approval number; and *added*
- (c) the part number of the appliance or part. *added*

(2) Subject to subsections (4) and (5), the manufacturer of an appliance or a part for which a Canadian Technical Standard Order (CAN-TSO) design approval has been issued under section 521.109 shall place on it, in the manner specified in subsection 201.05(2), the following additional identification information:

- (a) the manufacturer's address; *N/A TSO ONLY*
- (b) the name, type or model designation of the appliance or part, if any;
- (c) the serial number or the date of manufacture of the appliance or part;
- (d) the letters "CAN-TSO" followed by the applicable CAN-TSO number; and
- (e) any additional markings required by the applicable CAN-TSO.

(3) Subject to subsections (4) and (5), the manufacturer of an appliance or a part for which a type certificate has been issued by the Minister shall place on it, in the manner specified in subsection 201.05(2), the following additional identification information:

- (a) the manufacturer's address; *website*
- (b) the name, type or model designation of the appliance or part, if any; ✓
- (c) the serial number or the date of manufacture of the appliance or part; and ✓
- (d) the type certificate designation or a reference to the applicable standard of airworthiness. *added.*

(4) The manufacturer of an auxiliary power unit shall, in the manner specified in subsection 201.05(2), place the identification information specified in subsection (1) on the unit in an accessible location where it is not likely to become damaged, destroyed, lost or detached during normal operation or in an accident. *N/A*

(5) If an appliance or a part is too small or if it is otherwise impractical to place on it some or all of the information required by subsection (1), (2) or (3), the information that cannot be placed on the appliance or part shall be placed on its container or on the authorized release certificate referred

to in section 561.10 of Standard 561 — *Standard for Approved Manufacturers*.

SOR/2000-405, s. 5; SOR/2009-280, s. 20.

[Previous Version](#)

**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
ICA 1002.90**

AIRBUS HELICOPTERS AS350 & AS355 SERIES

QUICK RELEASE BICYCLE RACK

Jason Reviewed

22 June 2016

TCCA Supplemental Type Certificate No. SH _____
FAA Supplemental Type Certificate No. _____
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Bicycle Rack is installed in accordance with Aero Design Ltd. Document Control Lists:

- DCL1002-1 (AS350/AS355), Revision 0,
or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 22 June 2016

Aero Design Ltd.



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www.aerodesign.ca

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RECORD OF REVISIONS

Revision Number	Issue Date	Content Description and Changes
0	22/06/2016	Original issue

RECORD OF REVISION INSERTION

Revision Number	Issue Date	Date Inserted	By
0	22/06/2016	N/A	Original Issue

LIST OF EFFECTIVE PAGES

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4	0
04-00-00	5	0
05-00-00	6	0
	7	0
	8	0
	9	0
11-00-00	10	0
25-50-00	11	0
	12	0
	13	0
	14	0
	15	0

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Bicycle Rack Installation as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

CAUTION: This installation is NOT compatible with fixed or pop-out float installations.

NOTE: This installation is compatible with Aero Design Ltd. cargo basket installations on the opposite side of the aircraft. Cargo baskets from other manufacturers have not been evaluated.

0-5 GENERAL DESCRIPTION

The Quick Release Bicycle Rack is installed on the fixed mounting provisions used for cargo basket installations. The rack consists of a base made of aluminum extrusion welded to support beams, and stainless steel tubing frames attached to the base for securing the bicycles. The quick release bike rack allows for the installation and removal of the rack without tools, leaving the mounting beams in place.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Bicycle Rack.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Bicycle Rack.

Refer to the ICA764.90 for the AS350/AS355 Quick Release Cargo Basket for inspection requirements for the mounting provisions.

Daily Inspection

1. Inspection Area: Bicycle Rack

- a) Inspect the bicycle rack attachment to the mounting beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain bicycle rack, replace spring, refer to ICA764.90, section 25-9.
- b) Inspect the forward moveable wheel frame of each rack to ensure the frame slides freely, and that the locking lever secures the moving frame when rotated up to the closed position (parallel to the frame).

300 Hour or Annual Inspection

1. Inspection Area: Bicycle Rack

- a) Visually inspect bicycle rack for damage.
- b) Visually inspect welds on the rack base for cracks, corrosion or other damage.
- c) Visually inspect welds on the wheel locking frames for cracks, corrosion or other damage.
- d) Visually inspect lugs attaching the rack to the beams for security and damage.
- e) Visually inspect bolts securing wheel frames to rack for condition and security.
- f) Inspect locking cam and rollers on movable wheel frame (forward frame) for condition and operation. Test locking friction by installing a bicycle in the rack (see FMS1002.91 for instructions) and pulling forward on the bicycle frame with a spring scale, minimum 100 lbs (45 kg) breakout force is required. Pull from a point on the bike frame approximately level with the top of the wheel.

Special Inspections

1. Following a hard landing inspect the Quick Release Bicycle Rack installation in accordance with the 300 hour or annual inspection listed above.
2. Any joints using a helical thread insert (Helicoil) shall be inspected on assembly in accordance with the procedure for checking self locking nuts and screws specified in the Eurocopter Standard Practices Manual, Section 20.02.05.601

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

Refer to the ICA764.90 for the AS350/AS355 Quick Release Cargo Basket for further damage limits and repair instructions for the mounting provisions.

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Aluminum Rack Components

Part	Type of Damage	Max. Allowable	Repair
Support Beams	Corrosion	0.030" (0.8 mm) deep	Blend up to 0.030" (0.8 mm) deep with scotchbrite.
	Scratches / Nicks	0.030" (0.8 mm) deep x 0.5" (13 mm) long	Blend up to 0.030" (0.8 mm) deep with scotchbrite.
	Cracks - weld	0.25" (6 mm) max	See item 4.
	Cracks	None	N/A
	Dents	None	N/A
	Bent Lugs	None	N/A
Rail Sections	Corrosion	2" x 2" x 0.030" deep (50 mm x 50 mm x 0.8 mm)	Blend up to 0.030" (0.8 mm) deep with scotchbrite.
	Scratches / Nicks	Lateral: 0.030" (0.8 mm) deep x 1" (25 mm) long Longitudinal: 0.050" (1.3 mm) deep x 1" (25 mm) long	Blend up to 0.030" (0.8 mm) deep with scotchbrite.
	Cracks	None	See item 4.
	Dents	None	N/A
	Permanent Deflection of Rail	0.25" (3 mm) max between support beams	None
Straps (top of wheel frames)	Corrosion	0.030" (0.8 mm) deep	Blend up to 0.030" (0.8 mm) deep with scotchbrite.
	Scratches / Nicks	0.030" (0.8 mm) deep x 1" (25 mm) long	Blend up to 0.030" (0.8 mm) deep with scotchbrite.
	Cracks	None	N/A
	Dents	None	N/A

3. Stainless Steel Mounting Beams

Part	Type of Damage	Max. Allowable	Repair
Mounting Beams	Elongation of Keyway	See figure 5.1	None
	Widening of slots	See figure 5.1	None

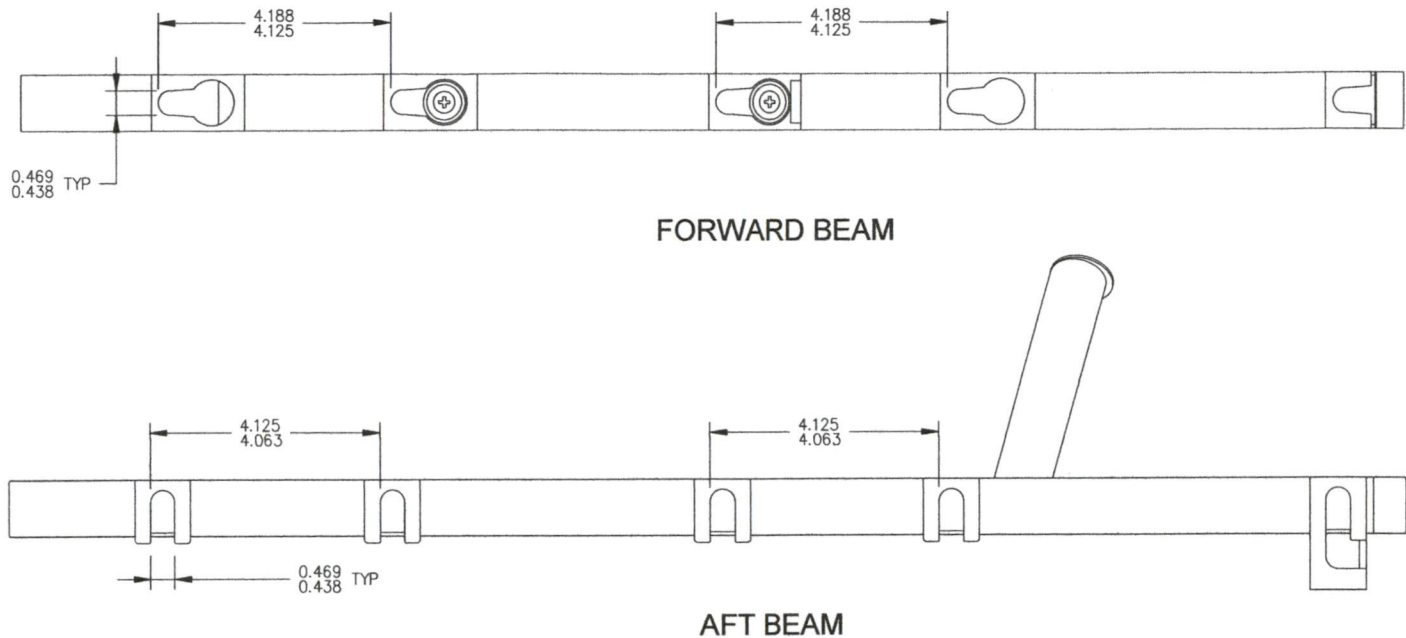


Figure 5.1 – Critical Keyway Dimensions (AS350 / AS355)

4. Rack Base Welds

Welds attaching the rails to the support beams must not extend beyond 0.5 - 0.75 inch (13 - 19 mm) below top surface of support beams, the remaining length under the rail is not welded. Cracks up to 0.25" long may be repaired as follows:

- Clean area of surface finish.
- Grind away weld in area of crack.
- T.I.G. weld per MIL-STD-2219 Class "C" using ER4043 filler rod. Do not grind flush.
- Touch up paint as noted in section 5-3.

5. Wheel Frame Welds

Frames are not welded in tight inside corners where access is limited. Cracks up to 0.13" long may be repaired as follows:

- e) Clean area of surface finish.
- f) Grind away weld in area of crack.
- g) T.I.G. weld per MIL-STD-2219 Class "C" using ER308L filler rod. Do not grind flush.
- h) Touch up surface finish as noted in section 5-3.

6. Helical Thread Inserts

Helical thread inserts (Helicoils) found to be damaged shall be repaired in accordance with the Airbus Helicopters (Eurocopter) Standard Practices Manual, Section 20.03.04.404.

Part numbers:

1/4-28 insert: 3591-4CN375

3/8-24 insert: 3591-6CN563

5-3 PROTECTIVE TREATMENT INFORMATION

1. Bicycle Rack

The aluminum components of the rack are supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

Alternate: The aluminum components of the rack are supplied painted. If the paint is damaged, touch up with polyurethane paint.

The stainless steel wheel frames are supplied polished (no surface finish).

Alternate: The stainless steel wheel frames are supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

Alternate: The stainless steel wheel frames are supplied painted. If the paint is damaged, touch up with polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation, located on the forward end of the rack base:

a) Bicycle Rack, Model 100210, AS350 / AS355

S/N 100201-01 and sub. (LH); S/N 100202-01 and sub. (RH)



CHAPTER 25 – EQUIPMENT AND FURNISHINGS

25-1 BICYCLE RACK REMOVAL

Refer to Figure 25.1 and Figure 25.2.

1. Pull knob on inboard side of forward beam and lift forward end of rack until attachment fittings are free of keyways.
2. Slide rack forward until aft attachment fittings are free of keyways and remove from helicopter.

25-2 BICYCLE RACK INSTALLATION

Refer to Figure 25.1 and Figure 25.2.

1. At aft mounting beam, slide rack attachment fittings into keyways on mounting beam.
2. At forward mounting beam, slide rack aft and lift rack until attachment fitting hits stop over keyway. Push fittings into keyways and slide rack down until locked.

25-3 BILL OF MATERIALS

Item	Qty.	Part Number	Description
01		100201-01-01	AS350 Low LH Bicycle Rack Installation
08	. 1	78602-01-02	AS350 Low LH Attachment Provisions Installation
13	. 1	100210-01	AS350 LH Bicycle Rack Assembly
02		100201-01-02	AS350 Low RH Bicycle Rack Installation
07	. 1	78602-01-01	AS350 Low RH Attachment Provisions Installation
14	. 1	100210-02	AS350 RH Bicycle Rack Assembly
(03)		100201-02-01	AS350 High LH Bicycle Rack Installation
(09)	. 1	78602-02-02	AS350 High LH Attachment Provisions Installation
13	. 1	100210-01	AS350 LH Bicycle Rack Assembly
(04)		100201-02-02	AS350 High RH Bicycle Rack Installation
(10)	. 1	78602-02-01	AS350 High RH Attachment Provisions Installation
14	. 1	100210-02	AS350 RH Bicycle Rack Assembly
(05)		100201-03-01	AS350 Cargo Pod Compatible LH Bicycle Rack Installation
(11)	. 1	78603-01-02	AS350 Cargo Pod Compatible LH Attachment Provisions Installation
13	. 1	100210-01	AS350 LH Bicycle Rack Assembly
(06)		100201-04-02	AS350 Cargo Pod Compat. RH Bicycle Rack Installation
(12)	. 1	78603-01-01	AS350 Low LH Attachment Provisions Installation
14	. 1	100210-02	AS350 RH Bicycle Rack Assembly

Table 25.1 – Bill of Materials (AS350 / AS355)
(see figure 25.1)

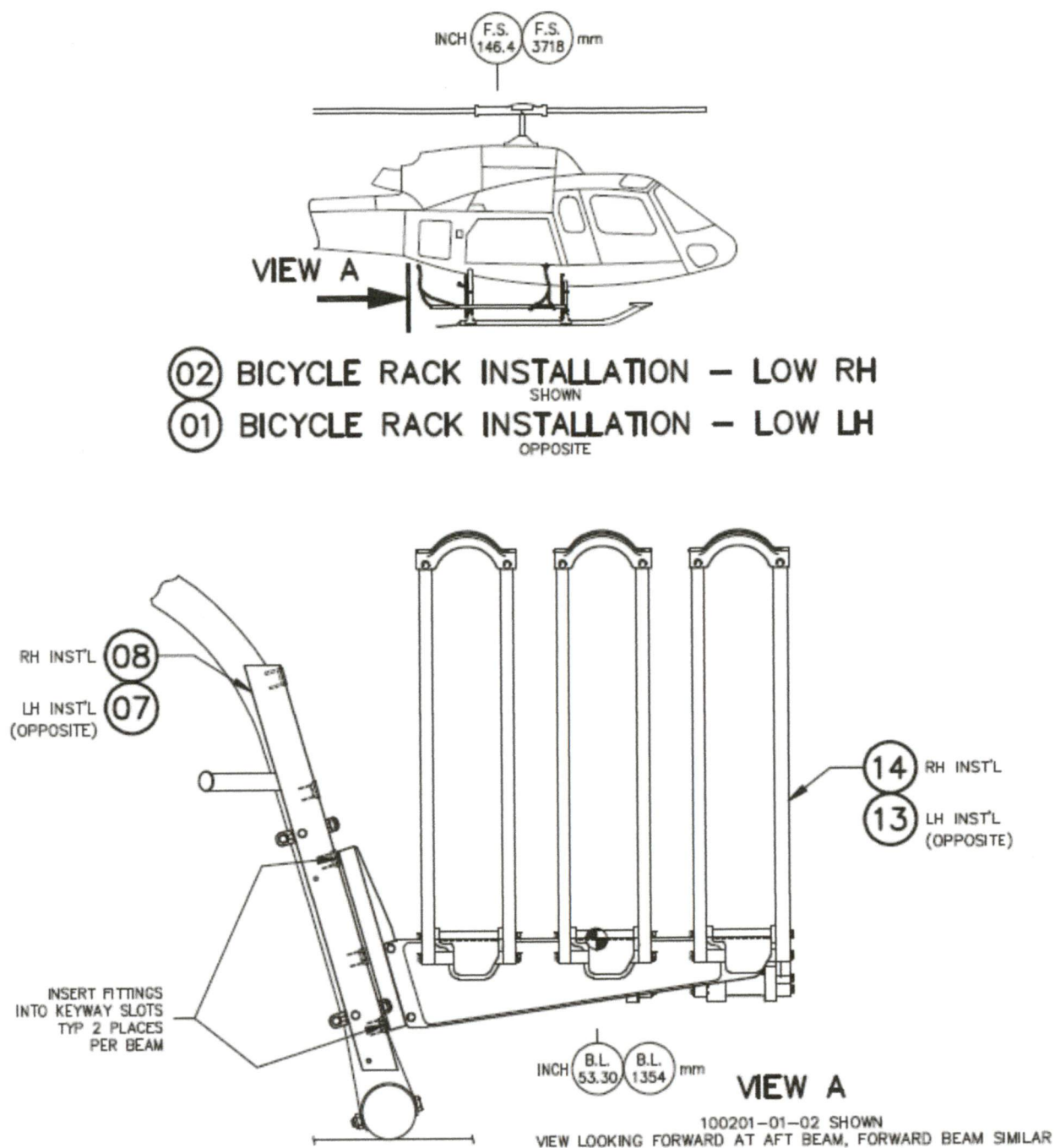


Figure 25.1 – AS350/AS355 Bicycle Rack Attachment

(Low configurations shown, High and Cargo Pod Compatible configurations identical)

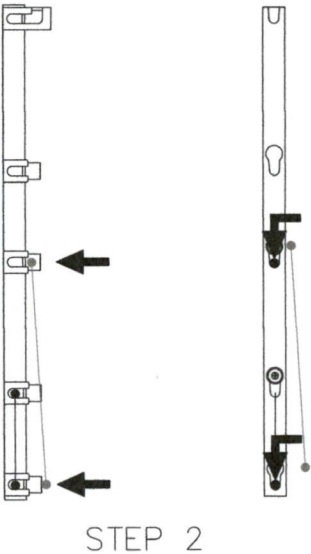
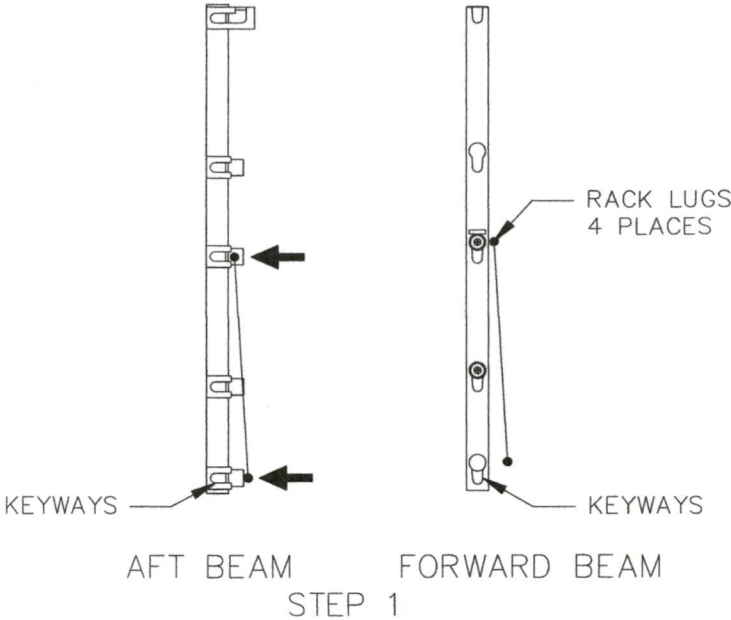


Figure 25.2 – Rack Attachment Steps

25-4 WEIGHT AND BALANCE – AS350 / A355

This section contains weight and balance information for mounting provisions and bicycle rack model 100210.

Two weight and balance configurations are required: Attachment Fittings and Mounting Beams (100902-01); and Bicycle Rack Installed (100201-01-XX).

*Low Mounting Provisions***Standard Units**

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-01-02	LH Low Attachment Provisions	6.4	135.60	867.50	-37.20	-238.00
100210-01	LH Bicycle Rack Assembly	61.8	146.37	9045.67	-53.30	-3293.94
100201-01-01	LH Low Bicycle Rack Installation	68.2	145.35	9913.17	-51.79	-3531.94
78602-01-01	RH Low Attachment Provisions	6.4	135.60	867.50	37.20	238.00
100210-01	RH Bicycle Rack Assembly	61.8	146.37	9045.67	53.30	3293.94
100201-01-02	RH Low Bicycle Rack Installation	68.2	145.35	9913.17	51.79	3531.94

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-01-02	LH Low Attachment Provisions	2.9	3443.0	9970.6	-944.6	-2735.4
100210-01	LH Bicycle Rack Assembly	28.0	3717.8	104217.5	-1353.8	-37950.3
100201-01-01	LH Low Bicycle Rack Installation	30.9	3691.6	114188.1	-1315.3	-40685.7
78602-01-01	RH Low Attachment Provisions	2.9	3443.0	9970.6	944.6	2735.4
100210-01	RH Bicycle Rack Assembly	28.0	3717.8	104217.5	1353.8	37950.3
100201-01-02	RH Low Bicycle Rack Installation	30.9	3691.6	114188.1	1315.3	40685.7

Table 25.3 – Weight and Balance

*High Mounting Provisions***Standard Units**

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-02-02	LH High Attachment Provisions	6.4	135.60	867.50	-36.50	-233.80
100210-01	LH Bicycle Rack Assembly	61.8	146.37	9045.67	-52.53	-3246.35
100201-02-01	LH Bicycle Rack Installation (total)	68.2	145.35	9913.17	-51.03	-3480.15
78602-02-01	RH Low Attachment Provisions	6.4	135.60	867.50	36.50	233.80
100910-01	RH Bicycle Rack Assembly	61.8	146.37	9045.67	52.53	3246.35
100902-02-02	RH Bicycle Rack Installation (total)	68.2	145.35	9913.17	51.03	3480.15

*High Mounting Provisions (continued)***Metric Units**

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-02-02	LH Low Attachment Provisions	2.9	3443.0	9970.6	-928.1	-2687.6
100210-01	LH Bicycle Rack Assembly	28.0	3717.8	104217.5	-1334.3	-37402.1
100901-02-01	LH Bicycle Rack Installation (total)	30.9	3691.6	114188.1	-1296.1	-40089.7
78602-02-01	RH Low Attachment Provisions	2.9	3443.0	9970.6	928.1	2687.6
100210-01	RH Bicycle Rack Assembly	28.0	3717.8	104217.5	1334.3	37402.1
100201-02-02	RH Bicycle Rack Installation (total)	30.9	3691.6	114188.1	1296.1	40089.7

Table 25.3 – Weight and Balance

*Cargo Pod Compatible Mounting Provisions***Standard Units**

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78603-01-02	LH Low Attachment Provisions	6.8	135.40	921.00	-38.80	-263.60
100210-01	LH Bicycle Rack Assembly	61.8	146.37	9045.67	-55.30	-3417.54
100201-03-01	LH Bicycle Rack Installation (total)	68.6	145.29	9966.67	-53.66	-3681.14
78603-01-01	RH Low Attachment Provisions	6.8	135.40	921.00	38.80	263.60
100210-01	RH Bicycle Rack Assembly	61.8	146.37	9045.67	55.30	3417.54
100201-03-02	RH Bicycle Rack Installation (total)	68.6	145.29	9966.67	53.66	3681.14

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78603-01-02	LH Low Attachment Provisions	3.1	3440.1	10584.8	-984.6	-3029.6
100210-01	LH Bicycle Rack Assembly	28.0	3717.8	104217.5	-1404.6	-39374.4
100201-03-01	LH Bicycle Rack Installation (total)	31.1	3687.6	114802.3	-1362.1	-42404.0
78603-01-01	RH Low Attachment Provisions	3.1	3440.1	10584.8	984.6	3029.6
100210-01	RH Bicycle Rack Assembly	28.0	3717.8	104217.5	1404.6	39374.4
100201-03-02	RH Bicycle Rack Installation (total)	31.1	3687.6	114802.3	1362.1	42404.0

Table 25.3 – Weight and Balance

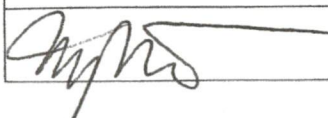
25-5 STRUCTURAL FASTENER DATA

Refer to Airbus Helicopters (Eurocopter) Standard Practices Manual for torque values not listed in this ICA.



**MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE
WITH THE CERTIFICATION BASIS**

**DÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ
AVEC LA BASE DE CERTIFICATION**

1. Reference Number NAPA File: P-15-0157 Aero Design Ltd. Project No.: 1002 Polaris Flight Test Services Project No.: AD 001		2. Applicant Name Aero Design Ltd.	
Part 1: Identification of Aeronautical Product			
3. Applicable Design Approval Document No. TCCA TCDS No.: H-83, H-87			
4. Model AS350, AS355 Series		5. Make Airbus Helicopters (Eurocopter)	
6. Type (Aircraft, engine, propeller, appliance, part) Helicopter			
Part 2: Substantiating Reports and Data			
7. Number	Rev. date	8. Title	
FTP1002.04, 0, 20 May 2016		Flight Test Plan (Certification)	
FTP1002.04, 0, 27 June 2016		Flight Test Report (Certification)	
FTP1002.03, 0, 27 June 2016		Flight Test Plan and Report (Company)	
9. Purpose of Finding Compliance With respect to Aero Design Ltd. STC SH16-29, Issue 1 - Installation of bicycle racks on quick release mounting provisions installed in accordance with STC SH08-16: <ul style="list-style-type: none">Flight test reports document findings with regards to performance and handling qualities, vibration, and ground resonance			
10. Applicable Elements of Certification Basis See Certification Plan CP1002, Revision 3, Appendix A, Compliance Program Checklist: <ul style="list-style-type: none">DAR 370 has addressed the findings of compliance with respect to flight test paragraphs as indicated in the report noted per Box 7 and 8. Specific Regulations are the flight test aspects of the following: FAR 27.45 [27-21], 27.51 [27-0], 27.65 [27-33], 27.67 [27-23] (AS355 only), 27.73 [27-0], 27.75 [27-0], 27.79 [27-21], 27.141 [27-21], 27.143 [27-21], 27.171 [27-0], 27.173 [27-44], 27.175 [27-34], 27.177 [27-21], 27.231 [27-0], 27.241 [27-0], 27.251 [27-0], 27.547 [27-3].			
Part 3: Ministerial Delegate Finding of Compliance with the Certification Basis			
Under the authority vested in me by the Minister under subsection 4.3(1) of the Aeronautics Act, I hereby find that the type design of the aeronautical product is in compliance with the certification basis as demonstrated by the applicant's substantiating reports and data to the best of my knowledge.			
11. Signature of Delegate	12. Name	13. Delegate No.	14. Date (yyyy-mm-dd)
	Michel Brulotte	DAR 370	2016-07-08

Jason Rekve

From: Mat Melsness <MMelsness@blackcombhelicopters.com>
Sent: June 9, 2016 11:00 AM
To: Jason Rekve
Subject: RE: max vibe

Sorry, I was out of town on a film job.

Unfortunately, it is not a simple answer, as it depends on the component. While we typically strive to balance 0.2 IPS or lower on all components in all regimes, the short shaft limit is in fact 0.8, the tail rotor limit is 0.35, and the mains are 0.2 in a hover and at cruise, but 0.35 in a 45° bank. When setting the hammers to reduce the 3 omega vibration, the limit is 0.6 IPS on the pilot side, and 0.7 on the co-pilot side. The MM recommends that it be set at 0.47 IPS at MCP for comfort.

For reference, the mains operate at ~393 RPM, the short shaft ~6000 RPM, and the tail rotor is at ~2040 RPM. 3 omega is at about 1180 RPM.

Cheers,

Mat Melsness

Chief Engineer / Airbus Fleet
Blackcomb Helicopters
1850 Airport Road, Pemberton BC Canada V0N 2L0
Office: (604) 894-5153 - Cell: (604) 966-1126 - Toll Free: (800) 330-4354
Email: mmelsness@blackcombhelicopters.com
Web: www.blackcombhelicopters.com

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From: Jason Rekve [jason@aerodesign.ca]
Sent: Thursday, June 09, 2016 08:36
To: Mat Melsness
Subject: max vibe

Good morning Mat;

Could you let me know the cut-off for vibe analysis asap? I'm sure you are like me in trying to get as close to zero as possible, but what are you trying to get below? Is it .2?

Thanks
Jason

Jason Rekve – M1/M2 AME
President and General Manager, PRM



Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada

Hi Hideki

49° 50' 50.65 N
124° 30' 59.19 W

hideki.eto@gov.bc.ca

Greg, Skydance.

Table F-2
Example of Flight Test Safety Checklist

Aircraft	AS300 B3	C-FDGA
Test Purpose	BIKE RACKS	1808
Flight Crew		
Flight Date	15 JUNE 2016	

Ref.	Checklist Item	N/A	Yes	No
1.	Crew Considerations			
1.1	Are all crewmembers fit to fly and sufficiently rested?		✓	
1.2	Is the crew familiar with operating the aircraft and its test equipment?		✓	
1.3	Have all crewmembers had sufficient time to consider the content of the test plan and understand the purpose of the tests?		✓	
1.4	Are all crewmembers confident in their ability to carry out the tests required, safely and efficiently?		✓	
1.5	Have all ground crewmembers been briefed adequately?		✓	
2	Test Planning			
2.1	Has a draft AFM or equivalent information covering operation of the aircraft been reviewed?		✓	
2.2	Are exceedances of any AFM limitations permitted and agreed to?	✓		
2.3	Are any additional flight limitations specified and agreed to?	✓		
2.4	Have any specific or unusual limitations been discussed and understood?		✓	
2.5	Has the written flight test plan been agreed to?		✓	
2.6	Is the flight permit valid for the proposed flight tests?		✓	
3	Equipment			
3.1	Are adequate communication systems available to all crewmembers?		✓	
3.2	Has all required safety equipment been installed and tested as necessary?		✓	
3.3	Is survivability equipment adequate for the flight taking into account the testing environment (e.g. over water, winter)?		✓	
3.4	Have the Flight Data Recorder and Cockpit Voice Recorder been tested as necessary?	✓		
4	Configuration			
4.1	Has a conformity inspection been performed?		✓	
4.2	Is the aircraft, without the test modifications, in the approved configuration?		✓	
4.3	Do aircraft test modifications correlate with required configuration?		✓	
4.4	Has disposition of all snags since last flight(s) been reviewed?		✓	
4.5	Has significant maintenance action since last flight been reviewed?		✓	
4.6	Has all required maintenance been accomplished?		✓	
4.7	Is aircraft weight and balance report valid and current for the test configuration?		✓	
4.8	Is aircraft correctly loaded in accordance with the weight and balance report?		✓	
4.9	Is flight test ballast adequately secured?		✓	
5	Safety Planning			
5.1	Has the Flight Test Safety Assessment been reviewed?		✓	
5.2	Has the flight test plan been briefed?		✓	
5.3	Have all required ground tests been completed?		✓	

5.4	Have previous tests results been reviewed?		✓	
5.5	Have anticipated results (including failures of the system under test) been reviewed?		✓	
5.6	Have any special test procedures been reviewed (covered in checklists if necessary)?	✓		
5.7	Have build-up techniques been developed?		✓	
5.8	Have criteria for discontinuing the test or flight been agreed to?		✓	
5.9	Have all safety/recovery procedures been briefed?		✓	
5.10	Have escape drills been adequately briefed?		✓	
5.11	If devices/interlocks are to be disabled during the flight (e.g. circuit breakers, warning horn, power lever baulk), have procedures been put in place to re-enable the devices following test?	✓		
5.12	Have all safety procedures for formation flight (e.g. chase aircraft), been briefed?	✓		
5.13	Has Crash Fire Rescue been informed and briefed?	✓		
6	Miscellaneous			
6.1	Have weather minimums been agreed to?		✓	
6.2	Have atmospheric conditions for the tests been agreed?		✓	
6.3	Have time of day limitations (e.g. sufficient daylight for rescue operations) been agreed to?		✓	
6.4	Is usable fuel commensurate with expected fuel usage during test flight and adequate reserves?		✓	
6.5	Are takeoff and landing runway(s) suitable?		✓	
6.6	Is the test area suitable?		✓	
6.7	Does applicant have insurance coverage in place?		✓	
6.8	Has a copy of the flight permit, a copy of the flight test plan and the estimated time of arrival for the flight been left on the ground with a responsible third party?		✓	
7	Other			
	Completed By: <i>JEFF CLARKE</i>			
	Date: <i>15 JUNE 2016</i>			

Aircraft

EMERGENCY CONTACT

STEVE GRAY - BLACKCOMB Sally Gray 604 932 8552
MICHEL BRULOTTE - FLIGHTTEST DAR - ROBIN 613-866-3166
MAT MELNESS - BLACKCOMB → MEGAN; 604-966-1122
JEFF CLARKE - AERO DESIGN 403 612 3080 ANGELA

Ground/Responsible persons

JIM TINSON - DAR *Jim Tinson* 15 June 2016.
JASON REWE - AERO DESIGN *Jason Rewe* 15 Jun 16

MICHAEL CHAN - TCCA - 604 666 8458

CR 20160615-2

CONFORMITY INSPECTION RECORD

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change
	Make	Model	Serial No.	Registration	Bike Rack Installation Flight Test
	Airbus Helicopters	AS350/AS355	N/A 4508 J	N/A C-FDGA J	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
Installation Drawing 100201, Rev. 0 P/N 100201-03-01 (cheek pod mounted, LH)	Malu	JUNE 15/2016			See additional information below.
Installation Drawing 100201, Rev. 0 P/N 100201-03-02 (cheek pod mounted, RH)	Malu	JUNE 15/2016			See additional information below.

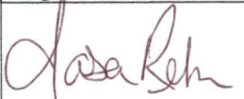
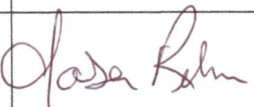
<u>APPLICANT'S ATTESTATION</u>	<u>TC INSPECTION</u>
<p>I hereby confirm that the prototype installation for the subject</p> <p><input checked="" type="checkbox"/> MODIFICATION,</p> <p><input type="checkbox"/> REPAIR,</p> <p><input type="checkbox"/> TSO/AP-TC ARTICLE</p> <p>is in conformity with the applicable installation drawing(s) listed above and that necessary ground tests have been carried out. [Please check (✓) the applicable box.]</p>	<p><input type="checkbox"/> ACCEPTABLE</p> <p><input type="checkbox"/> UNACCEPTABLE</p>
<u>Additional Information:</u>	<u>Remarks:</u>

Signature: Malu N790747
ACA 133.95.34

Signature: _____

CIR 2016 0615-1

CONFORMITY INSPECTION RECORD

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Bike Rack Installation Flight Test
	Make	Model	Serial No.	Registration	
	Airbus Helicopters	AS350/AS355	N/A	N/A	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
Assembly Drawing 100210, Rev. 0 P/N 100210-01-01 (LH Assembly)	 14 Jun 16				
Assembly Drawing 100210, Rev. 0 P/N 100210-01-02 (RH Assembly)	 14 Jun 16				

<u>APPLICANT'S ATTESTATION</u>	<u>TC INSPECTION</u>
<p>I hereby confirm that the prototype installation for the subject</p> <p><input checked="" type="checkbox"/> MODIFICATION,</p> <p><input type="checkbox"/> REPAIR,</p> <p><input type="checkbox"/> TSO/AP-TC ARTICLE</p> <p>is in conformity with the applicable installation drawing(s) listed above and that necessary ground tests have been carried out. [Please check (✓) the applicable box.]</p>	<p><input type="checkbox"/> ACCEPTABLE</p> <p><input type="checkbox"/> UNACCEPTABLE</p>
<u>Additional Information:</u>	<u>Remarks:</u>

Signature:  M795441

Signature: _____

Table F-1

Statement of Suitability for Flight Test

Aircraft Type/Model:

Registration:

Serial Number:

Description of Design Change(s):

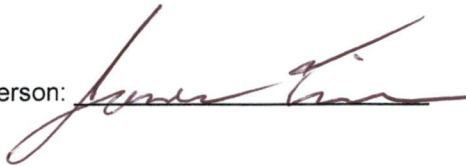
Installation of Aero Design Ltd. Quick Release Bicycle Rack in accordance with drawing 100201, Rev. 0, Dated 26 May 2016 on mounting provisions installed in accordance with STC SH08-16, drawing 78602 and/or 78603 as applicable. See AN-B043 Ed.2 CIR: 1002-20160615-142 for test configurations.

Statement of Suitability for Flight Test:

1 Assy 2 Install

This is to certify that I have reviewed the subject design change and that I have reasonable assurance that compliance could be found with all applicable design requirements, except for those requirements that shall be substantiated by flight testing. I consider the aircraft to be safe for flight.

Authorized Person:



Date:

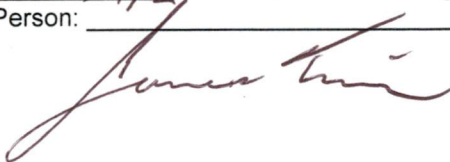
15 June 2016

(This information can be sent by mail or electronically)

Statement of Installation Conformity:

To the best of my knowledge today's flight test configuration as noted on the attached AME completed CIR: 1002-20160615-142 conforms to the drawings listed on this CIR.

Authorized Person:



Date:

15 June 2016



Transport Canada
Transports Canada

FLIGHT AUTHORITY

AUTORITÉ DE VOL

To - À: Blackcomb Helicopters Ltd, PO Box 1241, Whistler, BC, V0N 1B0

Nationality and Registration Marks Marques de nationalité et d'immatriculation C-FDGA	Aircraft Manufacturer and Model Constructeur et modèle de l'aéronef EUROCOPTER AS350B3	Aircraft Serial Number Numéro de série de l'aéronef 4808
--	---	---

<input type="checkbox"/> CERTIFICATE OF AIRWORTHINESS In respect of the noise emission standards this aircraft: En vertu des normes d'émission de bruit, l'aéronef mentionné:	<input type="checkbox"/> CERTIFICAT DE NAVIGABILITÉ <input type="checkbox"/> is not required to comply with requirements n'est pas obligé de satisfaire aux exigences <input type="checkbox"/> complies with the requirements specified below satisfait aux exigences précisées ci-dessous
--	---

<input type="checkbox"/> SPECIAL CERTIFICATE OF AIRWORTHINESS <input type="checkbox"/> Provisional - Provisoire <input type="checkbox"/> Restricted - Restreint This document is subject to the following operating conditions of issue: Le présent document est assujéti aux conditions d'exploitation suivantes :	<input type="checkbox"/> CERTIFICAT SPÉCIAL DE NAVIGABILITÉ <input type="checkbox"/> Amateur-Built - Construction amateur <input type="checkbox"/> Limited - Limité Indicate Numbers: Inscrire les numéros :
The aircraft may only be operated from: L'aéronef ne peut être exploité qu'à partir de :	Gross take-off weight not to exceed: Ne pas excéder la masse maximale brute au décollage : _____ lb _____ kg <input type="checkbox"/> As per Flight Manual - Selon le manuel de vol

<input checked="" type="checkbox"/> Flight Permit - Specific Purpose Permis de vol - Fin Spécifique <input type="checkbox"/> Ferry Flight Vol de convoyage <input type="checkbox"/> Importation or exportation flight Vol pour fin d'importation ou d'exportation <input checked="" type="checkbox"/> Other temporary purposes (Specify) Pour d'autres fins temporaires (Préciser)	<input type="checkbox"/> Flight Permit - Experimental Permis de vol - Expérimental <input type="checkbox"/> Demonstration, market survey or crew training Vol de démonstration, étude de marché ou formation d'équipage Test of Aero Design Bicycle Rack Per FTP1002.03
--	---

Flight from - Vol de Pemberton BC, CYPS	To - À Pemberton BC, CYPS	To - À N/A
---	-------------------------------------	----------------------

This document is subject to the following operating conditions of issue:	Le présent document est assujéti aux conditions d'exploitation suivantes :	Indicate Numbers: Inscrire les numéros : 3, 9, 12, 21, 29, 31 and 32
--	--	--

The aircraft may only be operated from: L'aéronef ne peut être exploité qu'à partir de : N/A	Gross take-off weight not to exceed: Ne pas excéder la masse maximale brute au décollage : _____ lb _____ kg <input checked="" type="checkbox"/> As per Flight Manual - Selon le manuel de vol
---	---

This document is valid for the number of days indicated on the right, following the date of issue. Where pertinent, a replacement flight authority will be issued to you.	Le présent document reste valide pendant le nombre de jours indiqués à droite qui suivent la date de délivrance. S'il y a lieu, une autorité de vol de remplacement vous sera délivré.	Days - Jours 30
---	--	---------------------------

For the Minister of Transport - Pour le ministre des Transports Shawn A Johnson	Date of Issue - Date de délivrance (yyyy-mm-dd / aaaa-mm-jj) 2016-05-31	Region - Région Pacific
---	--	-----------------------------------

Fee paid - Montant versé \$ <input type="checkbox"/> Cash <input type="checkbox"/> Cheque <input type="checkbox"/> Comptant	Receipt No. N° du reçu 2030892
--	--

Operating Conditions

1. Valid for the purpose of (specify purpose);
2. Use as a commercial aircraft prohibited;
3. Crew members only, no passengers;
4. Crew members only - no passengers, except those persons whom the pilot-in-command determines as having a bona fide interest in the demonstration;
5. Crew members shall be the holders of valid and subsisting pilot licences issued or endorsed by Canada or the (state of registry to be specified) and which are appropriate to their duties;
6. Gross take-off weight not to exceed (specific weight to be listed on the flight permit);
7. Flight into known or predicted icing conditions prohibited;
8. VNE to be established by flight test;
9. Day VFR only;
10. VFR only;
11. Flight over built-up areas prohibited;
12. Flight over built-up areas prohibited, and flight in congested airspace to be avoided;
13. Flight over built-up areas prohibited except during take-offs and landings;
14. Flight authority issued by (specify authority) shall be valid and shall be carried on board the aircraft together with this validation;
15. Controlling Air Traffic Control unit to be informed of the experimental nature of the aircraft and the evaluation program prior to flight;
16. The aircraft shall be formally or provisionally registered in (specify state);
17. Compliance required with the conditions on the (specify type of permit and authority);
18. Controlling Agency at airport of take-off shall be informed of overload conditions prior to take-off;
19. Permission of the foreign aviation authority required prior to flight in their airspace;
20. The aircraft can only operate from a base indicated by Transport Canada in order to provide the highest degree of safety for the operation of the aircraft;
21. The aircraft shall not be operated (flown) more than 25 nautical miles from the base mentioned in (20) except with written authority of the Regional Director Aviation Licensing, (specify region) Region, which will be provided, taking into account the safety of the flight;
22. The aircraft shall not be flown over any built-up area, or open air assembly of persons;
23. Carriage of persons other than for dual instruction is prohibited (not to be used for single seat aircraft);
24. Aerobatic flight is prohibited (not to be used for balloons);
25. During the first 5 hours of flight, the aircraft can only be flown by pilots who have acquired not less than 100 hours of pilot-in-command flight time in powered aircraft (not to be used for gliders, gyroplanes, or balloons);
26. Aircraft is to be registered for "Private Purposes" only;
27. Aircraft to be placarded in the cockpit "Restricted - Agricultural Purposes Only";
28. Validity period;
29. Flight testing to be conducted away from built-up areas, airways and air routes;
30. Ferry-flight (specify from) to (specify to) to be via (specify routing) with technical landings as required;
31. The side of the aircraft fuselage is to be placarded, in a place that is readily visible to persons entering the aircraft, in letters at least 3/8 inch in height and of a colour that contrasts sharply with the background on which they are shown, in both official languages, as follows:

NOTICE: THIS AIRCRAFT IS OPERATING WITHOUT A CERTIFICATE OF AIRWORTHINESS.

AVIS : CET AÉRONEF VOLE SANS CERTIFICAT DE NAVIGABILITÉ.

32. The aircraft shall be certified as serviceable for the proposed flight by a qualified Aircraft Maintenance Engineer or such other authorized person in the Aircraft Journey Log book prior to commencement of the flight.

33 The following operating limitation(s) as specified to the Minister shall apply:

*AIRCRAFT RESTRICTED TO OPERATING LIMITS
AS DETAILED IN AERO DESIGN KIT 1002-93
OR THE LIMITS OF THE AIRCRAFT FLIGHT
MANUAL WHICH EVER IS MORE RESTRICTIVE*

Conditions d'exploitation

1. Valide aux fins de (préciser les fins);
2. L'exploitation à titre d'aéronef commercial est interdite;
3. Membres d'équipage seulement - pas de passagers;
4. Membres d'équipage seulement - pas de passagers, sauf les personnes qui de l'avis du commandant de bord ont un intérêt réel dans la démonstration;
5. Les membres d'équipage doivent être titulaires de licences de pilote valides et en vigueur délivrées ou annotées par le Canada ou (préciser l'État d'immatriculation) et correspondant à leurs fonctions.
6. Ne pas excéder la masse maximale brute au décollage (qui doit être indiquée sur le permis de vol);
7. Vol interdit dans des conditions de givrage existantes ou prévues;
8. La VNE doit être établie par essai en vol;
9. VFR de jour seulement;
10. VFR seulement;
11. Le survol des zones bâties est interdit;
12. Le survol des zones bâties est interdit, et le vol dans un espace aérien à forte densité de circulation est à éviter;
13. Le survol des zones bâties est interdit, sauf au décollage et à l'atterrissage;
14. L'autorité de vol délivrée par (préciser l'autorité) doit être en vigueur et se trouver à bord de l'aéronef avec la présente validation;
15. L'unité de contrôle de la circulation aérienne qui exerce le contrôle doit être informée avant le vol de la nature expérimentale de l'aéronef et du programme d'évaluation;
16. L'aéronef doit être officiellement ou provisoirement immatriculé dans (préciser l'État);
17. La conformité avec les conditions figurant sur le (préciser le type de permis et l'autorité) est obligatoire;
18. L'organisme qui exerce le contrôle à l'aéroport de décollage doit être informé avant le décollage des conditions de surcharge;
19. Le vol dans l'espace aérien étranger est interdit, sauf avec l'autorisation préalable de l'autorité de l'aviation civile étrangère en cause;
20. L'aéronef ne peut être exploité qu'à partir de la base précisée par Transports Canada de façon à garantir le degré optimal de sécurité d'exploitation de l'aéronef;
21. L'aéronef ne peut être exploité que dans une zone d'un rayon maximum de 25 NM de la base mentionnée à l'alinéa 20, sauf avec l'autorisation écrite du directeur régional de la navigabilité, région (préciser la région), qui sera fournie compte tenu de la sécurité du vol;
22. Il est interdit de survoler des zones bâties ou des rassemblements en plein air;
23. Il est interdit de transporter des personnes sauf pour l'instruction en double commande (ne pas utiliser dans le cas des aéronefs monoplaces);
24. Le vol d'acrobatie aérienne est interdit (ne pas utiliser dans le cas de ballons);
25. Seul un pilote ayant accumulé au moins 100 heures de vol à titre de commandant de bord d'aéronefs propulsés par un organe moteur est autorisé à piloter cet aéronef au cours des cinq premières heures de vol (ne pas utiliser dans le cas des planeurs, des autogires ou des ballons);
26. L'aéronef doit être immatriculé « à des fins privées » seulement;
27. Une affiche « Restreint - fins agricoles seulement » doit être apposée dans le poste de pilotage;
28. Période de validité;
29. Les essais en vol doivent être effectués hors des zones bâties, des voies aériennes et des routes aériennes;
30. Le vol de convoyage doit être effectué de (préciser la partance) à (préciser la destination) via (préciser la route) avec escales techniques au besoin;
31. Une affiche doit être apposée au côté du fuselage de l'aéronef, en un endroit facilement visible pour les personnes qui montent dans l'aéronef, en lettres d'au moins 3/8 pouce de hauteur et d'une couleur contrastant clairement avec le fond sur lequel elles sont apposées, dans les deux langues officielles, portant les mots :

AVIS : CET AÉRONEF VOLE SANS CERTIFICAT DE NAVIGABILITÉ.

NOTICE: THIS AIRCRAFT IS OPERATING WITHOUT A CERTIFICATE OF AIRWORTHINESS.



BMG
INSURANCE BROKERS

CERTIFICATE OF INSURANCE
Policy No. AV 025461314-02

Certificate Holder(s):
To Whom It May Concern

THIS IS TO CERTIFY that Insurance as described hereunder has been arranged on behalf of the Named Insured noted herein and that such Insurance, as of the date hereof, is in full force and effect:

Named Insured: Blackcomb Aviation Limited Partnership by its general partner Blackcomb Aviation Ltd. a/o
Blackcomb Helicopters Limited Partnership by its general partner Blackcomb Helicopters Ltd. a/o
Omega Air Corporation c/o/b Blackcomb Aviation

Policy Period: From: July 1, 2015 To: July 1, 2016
(both dates at 00:01 a.m. Local Standard Time at the address of the Named Insured)

Aircraft Insured: All Rotary Wing Aircraft Owned, Operated and/or Leased by the Named Insured

Coverage: (A) Hull "All Risks" Rotors In Motion / Rotors Not In Motion
(B) Aircraft Legal Liability in respect of Third Party Bodily Injury and/or Property Damage
(inclusive of Passenger, Baggage and Cargo Liability)

Sum Insured / Limit(s) of Liability: (A) As agreed with the Named Insured
(B) CAD30,000,000 Combined Single Limit, each Occurrence

Conditions: As per policy issued by or on behalf of the Subscribing Insurer(s) as referenced herein.


Subscribing Insurer(s): Certain Canadian Licensed Insurers as effected through BMG Insurance Brokers

The Insurance described above is subject to the limitations, exclusions, terms and conditions contained in the policy(ies). By issuance of this Certificate BMG Insurance Brokers accepts no responsibility to maintain the coverage stated or advise of the termination of any policy(ies).

Date:
July 1, 2015

This Certificate cancels and
supersedes all previously issued
Certificates

On behalf of:
BMG Insurance Brokers

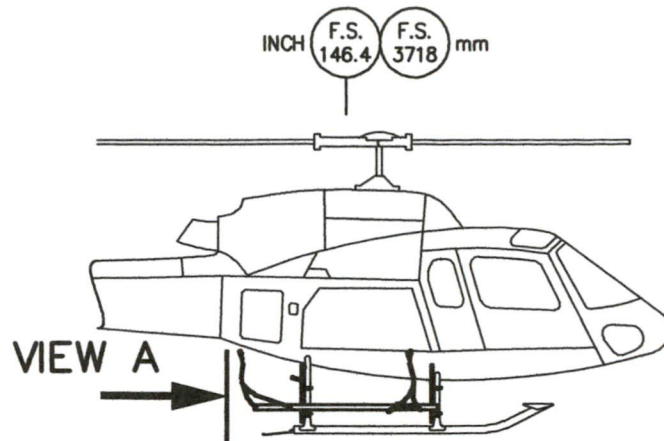

Authorized Representative

**** SEVERAL LIABILITY NOTICE ****

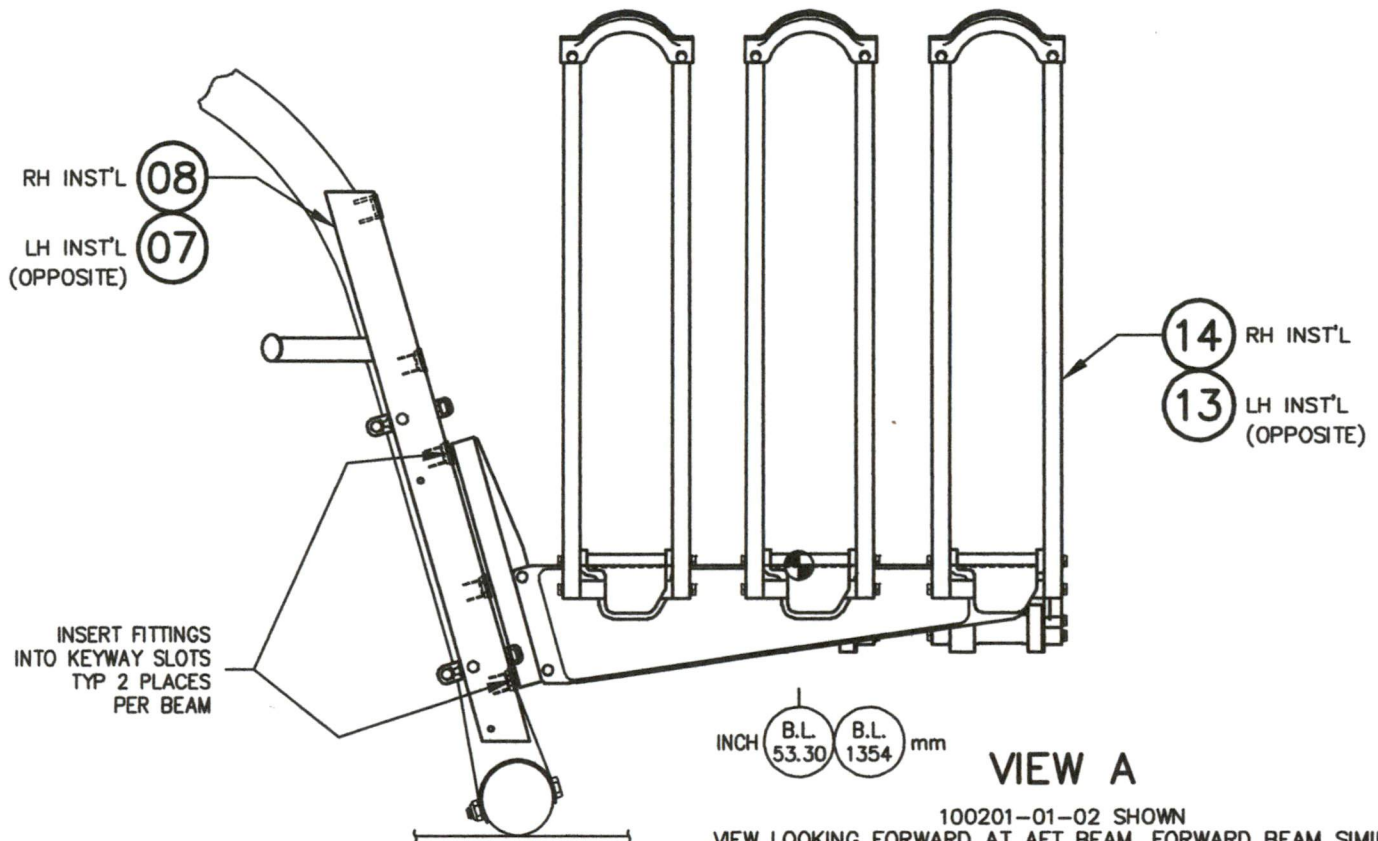
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4360 Agar Drive, Richmond, British Columbia, V7B 1A3
Phone: 604-276-2428 / Fax: 604-276-2445
www.bmginsurance.com

cc: Named Insured
Certificate No. HL-1



- (02) BICYCLE RACK INSTALLATION – LOW RH
SHOWN
(01) BICYCLE RACK INSTALLATION – LOW LH
OPPOSITE



100201-01-02 SHOWN
VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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APPROVALS	DATE
DRAWN: JEFF CLARKE	26 MAY 2016
CHECKED: JASON REKVE	26 MAY 2016
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1	



AERO DESIGN LTD.

9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 604.483.2376 www.aerodesign.ca

AIRBUS HELICOPTERS AS350 & AS355 SERIES
QUICK RELEASE BICYCLE RACK
BICYCLE RACK INSTALLATION (LOW)

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 4	A4	100201	0

Notes:

Velometer #1	Cabin Floor
Velometer #2	LH aft Mounting Beam
Velometer #3	Horizontal Stab
Velometer #4	Vertical Stab
Velometer #5	RH Mounting Beam

Position 1 - LH Outboard

Position 2 - LH Middle

Position 3 - LH Inboard

Position 4 - RH Inboard

Position 5 - RH Middle

Position 6 - RH Outboard

Standard Practice to try and achieve .2 IPS or lower.

Short Shaft max is .8

Tail Rotor Balance .35

M/R Balance .2 in hover and cruise

M/R Balance .35 in 45 degree bank

3 Omega .6 RH / .7 LH

†

Max Vibe @ RPM

Baseline - Approved Mounting Beams Installed Only
 Right Hand Rack Only
 Left Hand Rack Only
 Left Hand and Right Hand Rack Only
 Left Hand and Right Hand Rack, 1 Bike in Position 1
 Left Hand and Right Hand Rack, 1 Bike in Position 2
 Left Hand and Right Hand Rack, 1 Bike in Position 3
 Left Hand and Right Hand Rack, 1 Bike in Position 4
 Left Hand and Right Hand Rack, 1 Bike in Position 5
 Left Hand and Right Hand Rack, 1 Bike in Position 6
 Left Hand and Right Hand Rack, 2 Bikes in Position 5,6
 Left Hand and Right Hand Rack, 2 Bikes in Position 4,5
 Left Hand and Right Hand Rack, 2 Bikes in Position 4,6
 Left Hand and Right Hand Rack, 2 Bikes in Position 2,3
 Left Hand and Right Hand Rack, 2 Bikes in Position 1,3
 Left Hand and Right Hand Rack, 2 Bikes in Position 1,2
 Left Hand and Right Hand Rack, 3 Bikes in Position 1,2,3
 Left Hand and Right Hand Rack, 3 Bikes in Position 4,5,6
 Left Hand and Right Hand Rack, 6 Bikes in Position 1,2,3,4,5,6

.06 @ 0
 neg
 neg
 .056 @ 0
 neg
 neg
 neg
 .03 @ 0
 neg
 neg
 0.028 @ 0
 neg
 neg
 neg
 neg
 neg
 neg
 neg

Table F-1

Statement of Suitability for Flight Test

Aircraft Type/Model: Airbus Helicopters AS350

Registration: C-FDGA

Serial Number: 4808

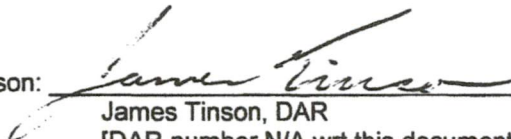
Description of Design Change(s):

Installation of Aero Design Ltd. Quick Release Bicycle Rack in accordance with drawing 100201, Rev. 0, using -02 Attachment Brackets per drawing 100230, Rev. 0, Dated 26 May 2016 on mounting provisions installed in accordance with STC SH08-16, drawing 78602 and/or 78603 as applicable.

Statement of Suitability for Flight Test:

This is to certify that I have reviewed the subject design change and that I have reasonable assurance that compliance could be found with all applicable design requirements, except for those requirements that shall be substantiated by flight testing. I consider the aircraft to be safe for flight.

Authorized Person:


James Tinson, DAR
[DAR number N/A wrt this document.]

Date: 1 June 2016

(This information can be sent by mail or electronically)

Aero Design Ltd.



9888A Malaspina Road
Powell River, BC, V8A 0G3
Phone: 604-483-2376
Fax: 604-483-2372
www.aerodesign.ca

FMS1002.91

AIRBUS HELICOPTERS (EUROCOPTER) AS350 & AS355 SERIES

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE BICYCLE RACK MODEL 100201

TCCA Supplemental Type Certificate No. _____
FAA Supplemental Type Certificate No. _____
EASA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory. Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Airbus Helicopters (Eurocopter) AS350 and AS355 Series Helicopters when fitted with the Quick Release Bicycle Rack Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement refer to the Approved Flight Manual and other approved Flight Manual Supplements.

DRAFT

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Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	26 May 2016	None		

I LIMITATIONS

1. The maximum load on the Aero Design Ltd. Quick Release Bicycle Rack, model 100201, is 50 lbs (22.7 kg) maximum per bicycle, and 150 lb. (68 kg) total per rack.
2. The Aero Design Quick Release Bicycle Rack may be installed on the left side, the right side or both sides.
3. All bicycles installed on the rack:
 - must be mountain bicycles intended for the following categories of riding: cross country, trail riding, all mountain (also referred to as "Enduro"), downhill, freeride or dirt jumping.
 - The tire size must be 26 inches (660 mm) minimum to 29 inches (740 mm) maximum.
 - The wheels must be attached to the bicycle frame with a closed loop attachment. Bicycles using slotted attachments are not to be installed.
 - The bicycle must be in serviceable condition.
 - The tires must be inflated to the manufacturer's specifications.
 - No loose equipment (e.g. water bottles) may be left on the bicycle.
4. Flight operations limited to VFR conditions with Aero Design Ltd. Quick Release Bicycle Rack installed.
5. V_{NE} is unchanged from the basic rotorcraft when the rack(s) is empty.

V_{NE} is 110 KIAS with the rack(s) loaded, unless the basic flight manual limitations are more restrictive.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all bicycles loaded on the rack are properly secured for flight, including any auxiliary equipment installed on the bicycles.
 - b) Ensure the bicycles are locked in position on the rack. Pull forward and side to side on the bicycle to check.
 - b) Ensure the rack is locked in position on the mounting beams. Pull up on the forward end of the rack to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the rack.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

One Bicycle Rack Installed (Left or Right Side):

To be determined

Two Bicycle Racks Installed:

To be determined

V WEIGHT AND BALANCE

This section contains weight and balance and loading information for bicycle rack model 100201.

The racks are limited to 50 lbs (22.7 kg) per bicycle, 150 lbs (68 kg) total per side. Heavier bicycles should be located on the inboard positions if possible.

Longitudinal moment arms for bicycles are given only for the location of an average bicycle with 26 inch (660 mm) tires. Larger bicycles with larger wheels will shift the CG forward. Due to the length and position of the rack, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

1. Bicycles Loaded on Rack

There are three possible configurations of mounting provisions. All three locate the rack at the same position longitudinally, but each is different laterally. Ensure the correct mounting configuration is used to determine weight and balance.

Standard Units										
Side	Description	Weight	Longitudinal		Lateral (Low Mounted 100201-01)		Lateral (High Mounted 100201-02)		Lateral (Cargo Pod Compatible 100201-03)	
			arm	moment	arm	moment	arm	moment	arm	moment
		lb	in	in-lb	in	in-lb	in	in-lb	in	in-lb
Left	Bicycle – inboard	50.0	161.00	8050.00	-45.80	-2290.0	-45.00	-2250.0	-47.80	-2390.0
	Bicycle – center	50.0	161.00	8050.00	-53.80	-2690.0	-53.00	-2650.0	-55.80	-2790.0
	Bicycle – outboard	50.0	161.00	8050.00	-61.80	-3090.0	-61.00	-3050.0	-63.80	-3190.0
Right	Bicycle – inboard	50.0	161.00	8050.00	45.80	2290.0	47.8	2250.0	47.80	2390.0
	Bicycle – center	50.0	161.00	8050.00	53.80	2690.0	55.8	2650.0	55.80	2790.0
	Bicycle – outboard	50.0	161.00	8050.00	61.80	3090.0	63.8	3050.0	63.80	3190.0

Metric Units										
Side	Description	Weight	Longitudinal		Lateral (Low Mounted 100201-01)		Lateral (High Mounted 100201-02)		Lateral (Cargo Pod Compatible 100201-03)	
			arm	moment	arm	moment	arm	moment	arm	moment
		kg	mm	mm-kg	mm	mm-kg	mm	mm-kg	mm	mm-kg
Left	Bicycle – inboard	22.7	4089.4	92746.1	-1162.1	-26354.9	-1143.0	-25922.8	-1214.1	-27535.8
	Bicycle – center	22.7	4089.4	92746.1	-1365.3	-30963.4	-1346.2	-30531.3	-1417.3	-32144.3
	Bicycle – outboard	22.7	4089.4	92746.1	-1568.5	-35571.9	-1549.4	-25139.8	-1620.5	-36752.8
Right	Bicycle – inboard	22.7	4089.4	92746.1	1162.5	26354.9	1143.0	25922.8	-1214.1	27535.8
	Bicycle – center	22.7	4089.4	92746.1	1365.3	30963.4	1346.2	30531.3	-1417.3	32144.3
	Bicycle – outboard	22.7	4089.4	92746.1	1568.5	35571.9	1549.4	25139.8	-1620.5	36752.8

2. Configuration 100201-01 – Bicycle Rack on Low Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-01-02	LH Low Mounting Provisions Installation	6.4	135.60	867.5	-37.20	-238.0
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.7	-53.30	-3102.1
100201-01-01	LH Low Bicycle Rack Installation (total)	64.6	145.30	9386.2	-51.70	-3340.1
78602-01-01	RH Low Mounting Provisions Installation	6.4	135.60	867.5	37.20	238.0
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.7	53.30	3102.1
100201-01-02	RH Low Bicycle Rack Installation (total)	64.6	145.30	9386.2	51.70	3340.1

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78602-01-02	LH Low Mounting Provisions Installation	2.9	3443.0	9970.6	944.6	2735.40
100210-01	LH Bicycle Rack Assembly	26.4	3717.8	98146.6	1353.8	35739.64
100201-01-01	LH Low Bicycle Rack Installation (total)	29.3	3690.1	108117.2	1313.2	38475.04
78602-01-01	RH Low Mounting Provisions Installation	2.9	3443.0	9970.6	944.6	2735.40
100210-01	RH Bicycle Rack Assembly	26.4	3717.8	98146.6	1353.8	35739.64
100201-01-02	RH Low Bicycle Rack Installation (total)	29.3	3690.1	108117.2	1313.2	38475.04

3. Configuration 100201-02 – Bicycle Rack on High Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-02-02	LH High Mounting Provisions Installation	6.4	135.60	867.50	-36.50	-233.80
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.73	-52.53	-3057.25
100201-02-01	LH High Bicycle Rack Installation (total)	64.6	145.30	9386.23	-50.94	-3291.05
78602-02-01	RH High Mounting Provisions Installation	6.4	135.60	867.50	36.50	233.80
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.73	52.53	3057.25
100201-02-02	RH High Bicycle Rack Installation (total)	64.6	145.30	9386.23	50.94	3291.05

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78602-02-02	LH High Mounting Provisions Installation	2.9	3443.0	9970.6	-928.1	-2687.6
100210-01	LH Bicycle Rack Assembly	26.4	3717.8	98146.6	-1334.3	-35223.3
100201-02-01	LH High Bicycle Rack Installation (total)	29.3	3690.1	108117.2	-1293.9	-37910.9
78602-02-01	RH High Mounting Provisions Installation	2.9	3443.0	9970.6	928.1	2687.6
100210-01	RH Bicycle Rack Assembly	26.4	3717.8	98146.6	1334.3	35223.3
100201-02-02	RH High Bicycle Rack Installation (total)	29.3	3690.1	108117.2	1293.9	37910.9

4. Configuration 100201-01 – Bicycle Rack on Cargo Pod Compatible Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78603-01-02	LH Cargo Pod Compatible Mounting Provisions Installation	6.8	135.40	921.00	-38.80	263.60
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.73	-55.30	3218.46
100201-03-01	LH Cargo Pod Compatible Bicycle Rack Installation (total)	65.0	145.23	9439.73	-53.57	3482.06
78603-01-01	RH Cargo Pod Compatible Mounting Provisions Installation	6.8	135.40	921.00	38.80	263.60
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.73	55.30	3218.46
100201-03-02	RH Cargo Pod Compatible Bicycle Rack Installation (total)	65.0	145.23	9439.73	53.57	3482.06

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78603-01-02	LH Cargo Pod Compatible Mounting Provisions Installation	3.1	3440.1	10584.8	-984.6	-3029.6
100210-01	LH Bicycle Rack Assembly	26.4	3717.8	98146.6	-1404.6	-37080.7
100201-03-01	LH Cargo Pod Compatible Bicycle Rack Installation (total)	29.5	3685.9	108731.4	-1359.7	-40110.3
78603-01-01	RH Cargo Pod Compatible Mounting Provisions Installation	3.1	3440.1	10584.8	984.6	3029.6
100210-01	RH Bicycle Rack Assembly	26.4	3717.8	98146.6	1404.6	37080.7
100201-03-02	RH Cargo Pod Compatible Bicycle Rack Installation (total)	29.5	3685.9	108731.4	1359.7	40110.3

VI INSTALLATION / REMOVAL INSTRUCTIONS

1. Bicycles on Rack

The racks are designed to accommodate bicycles with 26 – 29 inch (660 – 740 mm) tires, up to 4 inches (100 mm) wide, with sufficient clearance for brakes and suspension components.

The bicycles are retained by a moveable frame with a cam mechanism that locks down on the tires. The mechanism also locks the frame in position when the rack is not loaded.

CAUTION:

Deflated tires may not be gripped sufficiently to be safely retained in flight.

To provide maximum clearance from the helicopter, the most inboard bicycle shall be loaded with the handle bars aft. It is recommended to load the centre bicycle with the handle bars forward, and the outboard bicycle with the handle bars aft, however orientation of these bicycles is not mandatory and they shall be loaded as required to allow clearance from the airframe and between the pedals, gears, suspension and other components of adjacent bikes.

CAUTION:

Some loading combinations may require adapting the bicycle to fit, such as changing the height of or removing the seat or rotating the handle bars. Ensure all components are secured prior to flight.

A. Loading - Refer to Figure 1.

1. Set bicycle on rack. Slide bicycle aft forcefully to seat tire in aft fixed frame.
2. Slide moving frame aft forcefully to seat frame against tire. Push on lower part of frame for easiest movement.
3. Rotate lever on cam mechanism up to clamp frame into bicycle. Lever will snap into locked position.
4. Check bicycle is tightly retained by pulling side to side.

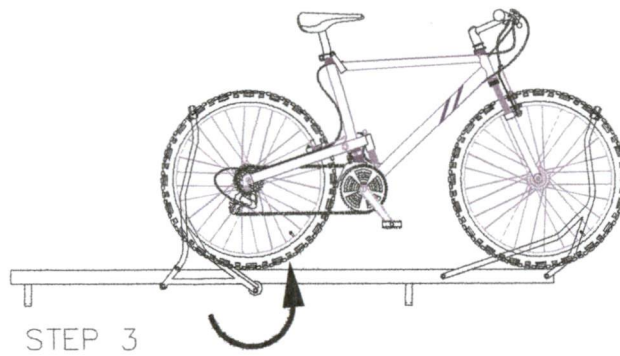
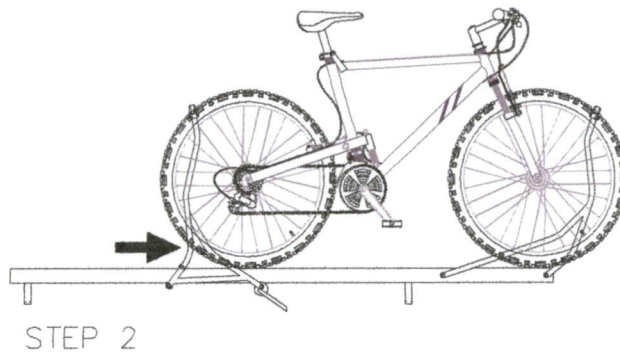
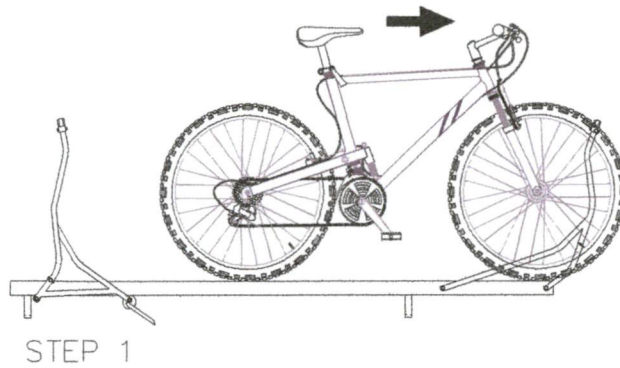


Figure 1 – Bicycle loading
(unloading is reverse)

B. Unloading - Refer to Figure 1.

1. Unlock cam on forward moving frame by rotating lever down to open position.
2. Slide moving frame forward. Pull on lower part of frame for easiest movement.
3. Pull bicycle forward to unseat from aft frame. Remove bicycle.

2. Bicycle Rack Assembly

The mounting beams are installed in accordance with drawing 78602 or 78603. The bicycle rack(s) is installed in accordance with drawing 100201. Logbook entry indicating installation or removal of bicycle rack and which weight and balance amendment is in effect is required when a bicycle rack is installed or removed.

A. Installation - Refer to Figure 2.

1. At aft mounting beam, slide rack attachment fittings into keyways on mounting beam.
2. At forward mounting beam, slide rack aft and lift rack until attachment fitting hits stop over keyway. Push fittings into keyways and slide rack down until locked.

B. Removal - Refer to Figure 2.

1. Pull knob at bottom end of forward beam and lift forward end of rack until attachment fittings are free of keyways.
2. Slide rack forward until aft attachment fittings are free of keyways and remove from helicopter.

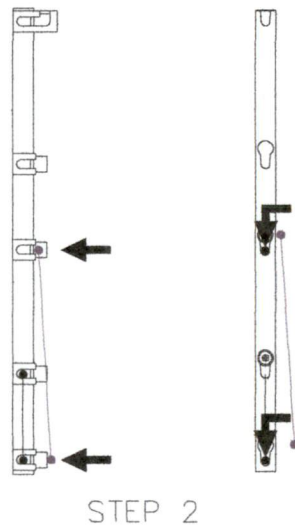
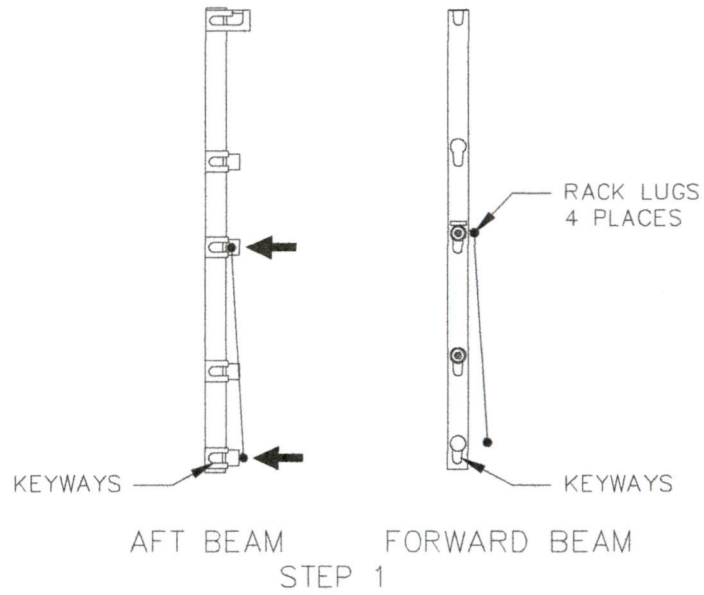


Figure 2 – Rack Attachment Steps

TEST PLAN AND REPORT

TR1002.02

AIRBUS HELICOPTERS AS350 & AS355 SERIES

QUICK RELEASE BICYCLE RACK INSTALLATION

LOAD TESTS

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 1, 08 April 2016

Aero Design Ltd.



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1.0 INTRODUCTION

This report documents the load tests used to demonstrate compliance with the structural requirements of the basis of certification.

2.0 REFERENCE TEXT

Engineering Report ER1002.01, Revision 1, Quick Release Bicycle Rack Installation – Compliance report

-Loads, section 4.0

3.0 REQUIRED ATTACHMENTS

- Aero Design Ltd. Drawings:
 - 100201, Revision 0 – AS350 Bicycle Rack Installation
 - 100210, Revision 0 – AS350 Bike Rack Assembly

Note: Mounting Provisions Installation drawing (78602, Revision 1) and bike rack fabrication drawings will be available for witness DAR's review
- Aero Design Ltd. (company only) completed AN B043 Conformity Inspection Record
- Calibration Certificate 371377 for Hanson Spring Scale Model 8930 (0-300 lb)
- Calibration Certificate 371378 for Pelouze Balance Scale Model 4010 (0-150 lb), S/N 401008011270, used to weigh lead shot
- Calibration Certificate for Virtual Measurements and Control Load Cell Model VC-210 / BSS-3K (3000 lb), S/N 11134 / 5H261302000315
- TR1002.02_1_Load.Test.Photo.Record.No.1.pdf. to meet the photo record keeping requirements wrt both test loads and distortion. i.e.; Front-top angle and side views of Pre-Load, Limit/Ultimate test configurations and post-test condition.

4.0 LOADS

The loads are determined in Engineering Report ER1002.01, Revision 1. The summarized loads are below.

Load Condition	Load	Applied to	Load location (on bike/rack)	Load location (reference, aircraft position)
Ultimate Drag (110 KIAS)	159 lbs (aft)	Bike in rack	Bike frame at head set intersection	40.5" above skid tubes, BL 52.12"
Limit Positive Maneuvering and Drag (110 KIAS)	735 lbs (down) 427 lbs (aft)	Rack	Downward load distributed equally between the 3 rails, centered over the aft mounting beam Drag load pulled on center rail	FS 164.1 BL 52.12 40.5" above skid tubes, BL 52.12"
Ultimate Positive Maneuvering and Drag (110 KIAS)	1102 lbs (down) 640 lbs (aft)	Rack	Downward load distributed equally between the 3 rails, centered over the aft mounting beam Drag load pulling on center rail	FS 164.1 BL 52.12 40.5" above skid tubes, BL 52.12"
Negative Maneuvering	75 lbs (up)	Bike in rack	Frame intersection in front of seat post	FS 164.1
Side	100 lbs (side)	Bike in rack	Frame intersection at seat post, height must be at top of wheel or higher.	40.5" above skid tubes, FS 164.1
Ultimate Forward	100 lbs (forward)	Bike in rack	Bike frame at head set intersection	40.5" above skid tubes, BL 52.12"

5.0 TEST SETUP

5.1 Test Articles

The tests will be performed using the following parts fabricated and assembled in accordance with their respective drawings:

100210-01 – LH AS350 Bike Rack Assembly

78620-01 – Clamp Assembly (4)

78633-01-02 – LH Aft Beam Assembly

78634-01-00 – Forward Beam Assembly

Form AN B043 conformity inspection record will be completed by Aero Design Ltd.

Bicycles – (Model, with 26" x ?? tires) ^{1.95} Norco Mountaineer 27.2 lb
 (model, with 29" x ?? tires) ^{1.95} Wicked Fallout ~~27.2~~ 33.2 lb

5.2 Test Fixture

The tests are performed on a fixture that simulates the helicopter landing gear.

The fixture consists of two large rectangular steel tubes (4" x 6" x 3/8" wall), each welded to a base plate (1/2"), with channels (C5x6.7) welded to the sides to provide mounting points for further fixtures specific to the aircraft to be simulated. Tabs (1/4" plate) are welded to the top of the tubes to install bracing as required to maintain rigidity. The fixtures are bolted down to inserts in the concrete floor.



Figure 5.2.1 – Test Fixture – Looking forward at aft fixture



Figure 5.2.2 – Test Fixture – Looking forward at forward fixture

For this configuration, a set of scrap AS350 landing gear is used. The landing gear is attached to the fixture by the cross tube to simulate the aircraft attachment. The mounting provisions are installed in accordance with drawing 78602. The bike rack is installed on the quick release mounting beams in accordance with drawing 100201.

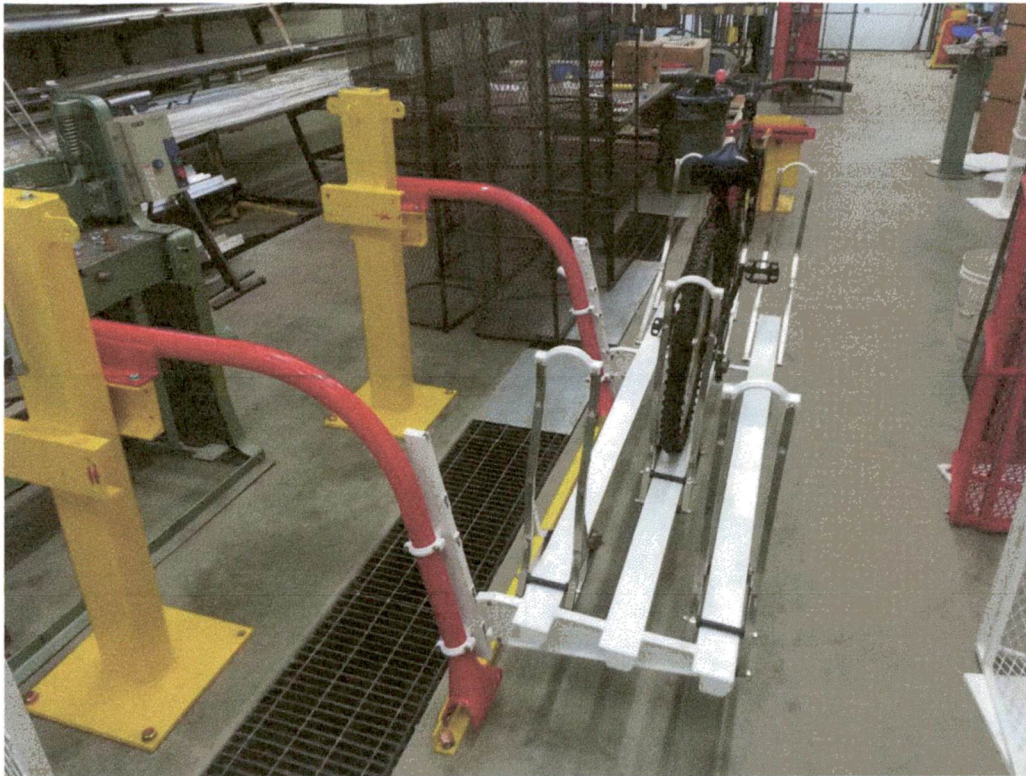


Figure 5.2.3 – Test Setup – Looking down and aft

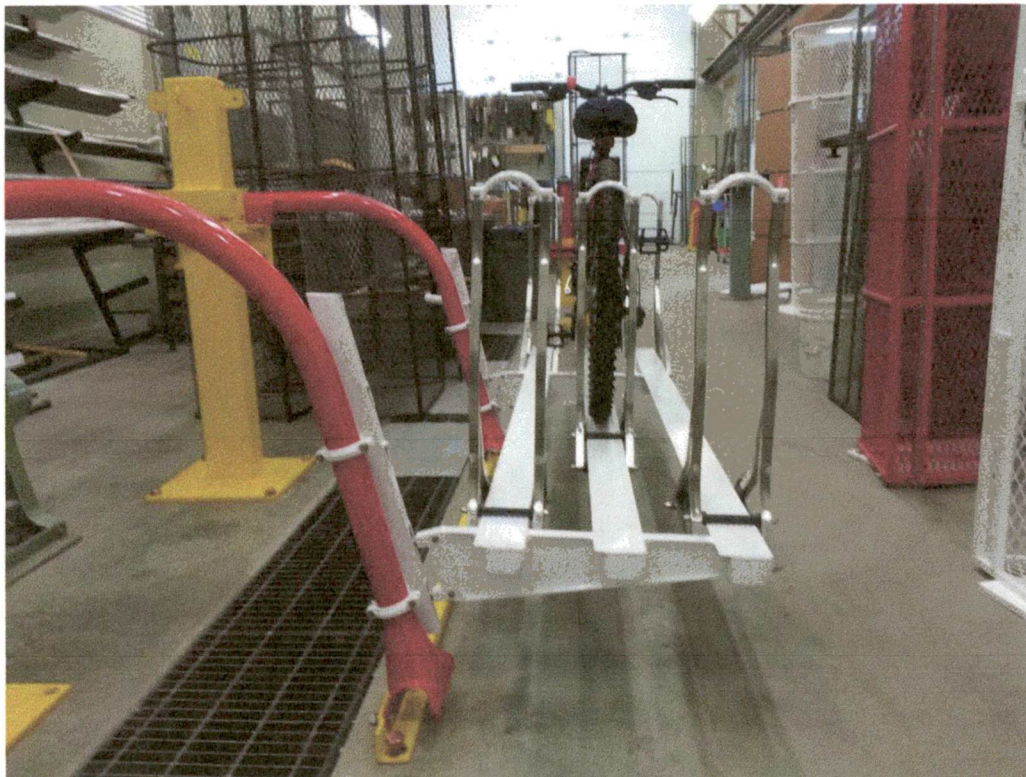


Figure 5.2.4 – Test Setup – Looking aft

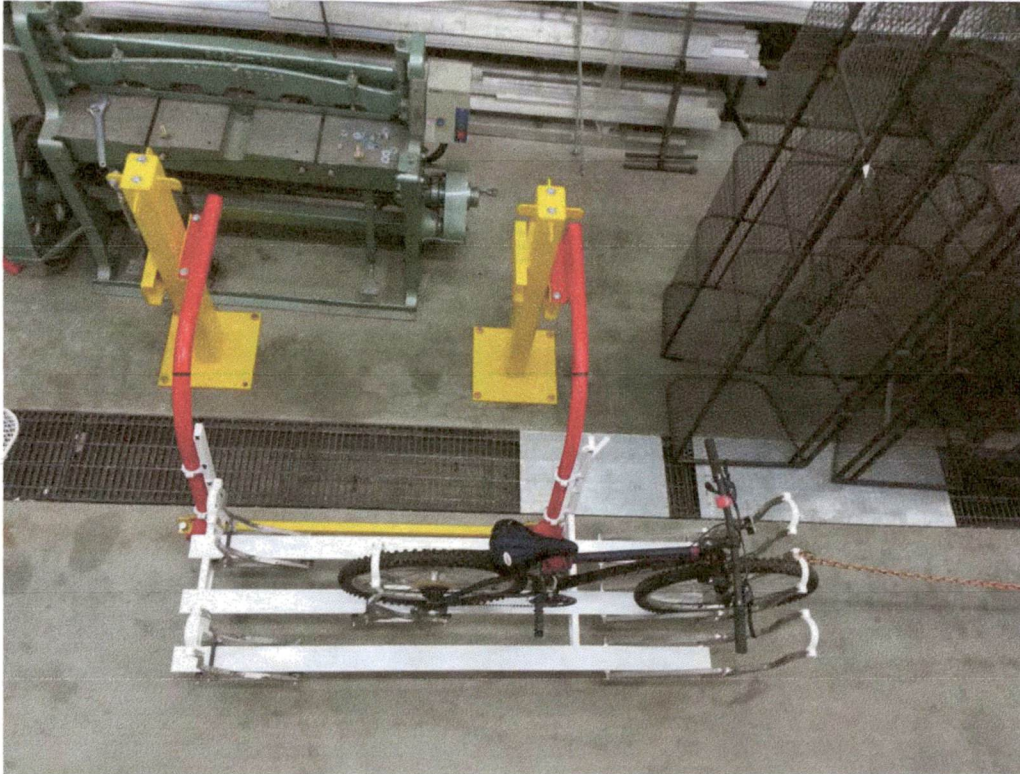


Figure 5.2.5 – Looking Down

To simulate drag on the rack in the combined maneuvering load condition, a wood 2x4 shall be clamped at the top of the aft frames with provisions for attaching chains or ropes (e.g. eye bolts or shackles) near the ends of the 2x4. A Y arrangement of chains or ropes shall be used to connect the ends of the 2x4 to a load cell, pulling back against a post secured to the floor.

5.3 Procedure

5.3.1 Functional Test

1. Install the bike rack on the mounting provisions on the test fixture.
2. Slide moveable forward frame along rack, ensuring it does not bind on the rack.
3. Insert bike onto rack with handlebars aft and secure the bike by moving the forward frame into contact with tire and locking the cam lever.
4. Pull bike by hand up and down, and side to side to ensure it does not come free of the rack. Further testing to ensure the bike is restrained is specified below.
5. Un-lock the cam lever to release the bike, and slide the forward frame to remove the bike. Remove the bike from the rack.
6. Record satisfactory performance of the functional test in section 6.1 below.

5.3.2 Individual Bike - Drag Load

1. Install the bike rack on the mounting provisions on the test fixture. Insert bike onto rack with handlebars aft and secure the bike by moving the forward frame into contact with tire and locking the cam lever.
2. Pull drag load on bike frame using a strap. Seat the strap in the frame intersection with the head set tube.
3. Pull the ultimate drag load (159 lbs) aft on bike using a spring scale.
4. The load must be applied for at least 3 seconds.
5. Document the test with pictures of the load application and of the overall test.
6. With the load applied, CAREFULLY attempt to shift the bike in frame. Ensure the bike cannot be pulled free of the frame.
7. CAREFULLY release the drag load.
8. Inspect the bike on the frame. Ensure that applying and releasing the drag load has not loosened the bike in the frame.
9. Remove the bike from the rack.
10. Visually inspect the bike rack for signs of permanent deformation.
11. Record the results in section 6.2 below.

5.3.3 Individual Bike - Negative Maneuvering Load

1. Install the bike rack on the mounting provisions on the test fixture. Insert bike onto rack and secure the bike by moving the forward frame into contact with the tire and lock the cam lever.
2. Pull upward on the bike frame using a strap. Seat the strap in the frame intersection near the seat post.
3. Pull the ultimate negative maneuvering load (75 lbs + weight of test bike).
4. The load must be applied for at least 3 seconds.
5. Document the test with pictures of the load application and of the overall test.
6. With the load applied, CAREFULLY attempt to shift the bike in frame. Ensure the bike cannot be pulled free of the frame, including by rotating the handlebars.
7. CAREFULLY release the load.

8. Inspect the bike on the frame. Ensure that applying and releasing the negative maneuvering load has not loosened the bike in the frame.
9. Remove the bike from the rack.
10. Visually inspect the bike rack for signs of permanent deformation.
11. Record the results in section 6.3 below.

5.3.4 Individual Bike - Side Load

1. Install the bike rack on the mounting provisions on the test fixture. Insert bike onto rack and secure the bike by moving the forward frame into contact with tire and locking the cam lever.
2. Pull sideways on the bike frame using a strap. Seat the strap on the upper frame or on the seat tube.
3. Pull the ultimate side load (100 lbs).
4. The load must be applied for at least 3 seconds.
5. Document the test with pictures of the load application and of the overall test.
6. With the load applied, CAREFULLY attempt to shift the bike in frame. Ensure the bike cannot be pulled free of the frame, including by rotating the handlebars.
7. Inspect the bike on the frame. Ensure that applying and releasing the side load has not loosened the bike in the frame.
8. Remove the bike from the rack.
9. Visually inspect the bike rack for signs of permanent deformation.
10. Record the results in section 6.4 below.

5.3.5 Combined Positive Maneuvering and Drag Load

1. Install the bike rack on the mounting beams.
2. Apply the limit maneuvering load (weight of rack applies 1g down, 735 lbs – 60 lbs = 675 lbs) downward using bags of lead shot, 25 lbs each, distributed over the bottom of the rack, centered on the aft attachment frame. 28 bags are required (700 lbs total).
3. Pull limit drag load (427 lbs) aft on center rack using a load cell and chain come-along.
4. The load must be applied for at least 3 seconds.
5. Document the test with pictures of the bags of lead shot stacked on the rack and of the overall test.
6. CAREFULLY release the drag load.
7. CAREFULLY remove the bags of lead shot. Keep feet clear of rack.
8. Visually inspect the bike rack, mounting beams and attachment fittings for signs of permanent deformation.
9. Apply the ultimate maneuvering load (weight of rack applies 1g down, 1102 lbs – 60 lbs = 1042 lbs) downward using bags of lead shot, 25 lbs each, distributed over the bottom of the rack, centered on the aft attachment frame. 42 bags are required (1050 lbs total).
CAUTION: KEEP FEET CLEAR FROM UNDER BIKE RACK.
10. Pull ultimate drag load (640 lbs) aft on center rack using a load cell and chain come-along.
11. The load must be applied for at least 3 seconds.

12. Document the test with pictures of the bags of lead shot stacked on the rack and of the overall test.
13. CAREFULLY release the drag load.
14. CAREFULLY remove the load from the rack. Keep feet clear of rack. Remove the bike rack from the mounting beams.
15. Visually inspect the bike rack, mounting beams and attachment fittings for signs of permanent deformation or failure.
16. Record the results in section 6.5 below.

5.3.6 Contaminated Mechanism Forward Load

1. Install the bike rack on the mounting provisions on the test fixture. Apply contaminant to rollers on forward frame and bike rack, see table in section 5.7 for list of contaminants. Ensure the forward frame will be locked in the contaminant with the bike inserted.
2. Insert bike onto rack with handle bars forward and secure the bike by moving the forward frame into contact with the tire and lock the cam lever.
3. Pull forward load on bike frame using a strap. Seat the strap in the intersection with the head set tube. Minimum required load is 100 lbs.
4. Repeat test at least 3 times.
5. Record the results in section 6.7 below. Record the breakout load required to start movement of the forward frame if less than 100 lbs.
6. Clean the applied contaminant and repeat tests for each contaminant in table.

5th
Trey
using
Longer
Mount
Bracket

Load	100	700	100	700	700	100
h _{fuel}	11 $\frac{1}{4}$	11 $\frac{1}{4}$	11 $\frac{1}{4}$	11 $\frac{1}{4}$	11 $\frac{1}{4}$	11 $\frac{1}{4}$
Alt	11 $\frac{1}{16}$	10 $\frac{5}{16}$	10 $\frac{7}{8}$	10 $\frac{5}{16}$	10 $\frac{1}{2}$	10 $\frac{3}{4}$
Dry	-	-	-	450	450	

And lower Alt Tube Clamps replaced.

Load	1050	1050	100
Fu	11		11
Alt	10 $\frac{1}{4}$		10 $\frac{3}{8}$
Dry	-	670	-

6.0 TEST RESULTS

6.1 Functional Test

Tests witnessed by TCCA DAR 304 James Tinson on XX.

Condition	Satisfactory (Y/N)	Notes
Functional Test	Yes	OKAY JLT 25 Apr 2016.

6.2 Individual Bike Drag Load

Tests witnessed by TCCA DAR 304 James Tinson on XX.

6.2.1 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Drag (aft) 26" tires	159 lbs (pulled on bike)	lbs 160	JLT 25 Apr 2016
Ultimate Drag (aft) 29" tires	159 lbs (pulled on bike)	lbs 160	JLT 25 Apr 2016.

(The rack sustained the ultimate drag load applied to the bike. During the test the bike was checked to ensure it would not pull free of the frame. After completing the ultimate load test, the bike was checked to ensure it had not come loose in the frame. The rack was inspected for signs of permanent deformation. There was none found.)

6.3 Individual Bike Negative Maneuvering Load

Tests witnessed by TCCA DAR 304 James Tinson on XX.

6.3.1 Ultimate Load

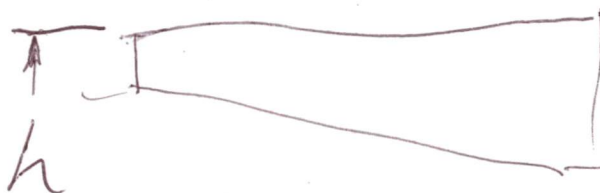
Condition	Required Load	Actual Load	Witness Initial
Ultimate Negative Maneuvering Load (up) 26" tires	75 lbs (pulled on bike)	lbs 125	JLT 25 Apr 2016
Ultimate Negative Maneuvering Load (up) 29" tires	75 lbs (pulled on bike)	lbs 125	JLT 25 Apr 2016.

(The rack sustained the ultimate negative maneuvering load applied to the bike. During the test the bike was checked to ensure it would not pull free of the frame. After completing the ultimate load test, the bike was checked to ensure it had not come loose in the frame. The rack was inspected for signs of permanent deformation. There was none found.)

		100	675	100
3rd	h End	$11\frac{1}{2}$	$10\frac{7}{8}$	11
try	h aft	$11\frac{3}{8}$	$10\frac{7}{8}$	$10\frac{7}{8}$
New beam		NO Drag → <u>Deformation</u>		

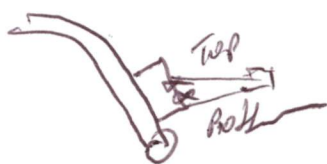
		100	675	100	675	100
4th larger	h End	$11\frac{1}{2}$	$11\frac{1}{4}$	$11\frac{3}{8}$	$11\frac{3}{8}$	$11\frac{3}{8}$
Trx. Maint	h aft	$11\frac{5}{16}$	$10\frac{3}{4}$	11	$10\frac{3}{4}$	11

Post	h End	100
Drag	h aft	$10\frac{5}{8}$



	h	0	100	675	100
	↓				10 1/8
Test 1st	h End	10 3/8	✓	10	9 3/4
	h Aft	10 1/4	✓	9 1/2	9 3/4
		← Drag → deformation			
		100	675	100	
	h End.	10 3/8			
2nd Test.	h Aft.	10 1/4	9 1/2	9 7/8	deformation
			wt w/o Drag.		Chmist

deformation
 limit
 bending @
 top + lower tube
 been connections



6.4 Individual Bike Side Load

Tests witnessed by TCCA DAR 304 James Tinson on XX.

6.4.1 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Side Load 26" tires	100 lbs (pulled on bike)	lbs 105 105 lbs	JL 25 Apr 2016
Side Load 29" tires	100 lbs (pulled on bike)	lbs * 105 105 lbs	JL 25 Apr 2016

* 2nd 29" Bike Norco Charger 18 1/2" 29x2.10
(The rack sustained the ultimate sideward load applied to the bike. During the test the bike was checked to ensure it would not pull free of the frame. After completing the ultimate load test, the bike was checked to ensure it had not come loose in the frame. The rack was inspected for signs of permanent deformation. There was none found.)

6.5 Positive Maneuvering Load

Tests witnessed by TCCA DAR 304 James Tinson on XX.

6.5.1 Limit Load

Condition	Required Load	Actual Load	Witness Initial
Limit Maneuvering Load (downward)	735 lbs (677 test) (distributed over rack)	lbs 700 *	JL 25 Apr 2016
Limit Drag (aft)	427 lbs (pulled on rack)	lbs 440 450 550	JL 25 Apr 2016

* 5th Try Longer bikes, new off load clamp re-rigged.
(The bike rack and mounts supported the limit positive maneuvering and drag loads for more than 3 seconds. After completing the limit load test, the bike rack was inspected for permanent or detrimental deformation. There was none found.)

6.5.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Maneuvering Load (downward)	1102 lbs (1042 test) (distributed over rack)	lbs 1050	JL 25 Apr 2016
Ultimate Drag (aft)	640 lbs (pulled on rack)	lbs 670	JL 25 Apr 2016

(The bike rack and mounts supported the ultimate positive maneuvering and drag loads for more than 3 seconds. After completing the ultimate load test, the bike rack and mounts were inspected for permanent or detrimental deformation and failure. There was none found.)

6.6 Side Load

Tests witnessed by TCCA DAR 304 James Tinson on XX.

NA per ER1002.02
25 Apr
2016

6.6.1 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Side Load 26" tires	260 lbs (on frame) 130 lbs (low)	lbs	
Side Load 29" tires	100 lbs (pulled on bike)	lbs	

(The rack sustained the ultimate sideward load applied to the bike. During the test the bike was checked to ensure it would not pull free of the frame. After completing the ultimate load test, the bike was checked to ensure it had not come loose in the frame. The rack was inspected for signs of permanent deformation. There was none found.)

6.7 Contaminated Mechanism Pull Test

Tests witnessed by TCCA DAR 304 James Tinson on XX.

6.7.1 Ultimate Load

Condition	Breakout Loads <i>100 lb Test</i>	Witness Initial
Bare (powder coat), no contaminants	<i>105</i>	<i>JL 25 Apr 2016</i>
Diesel fuel (in lieu of Jet A)	<i>110 110 120</i>	<i>JL 25 Apr 2016</i>
Aeroshell Fluid 41 (hydraulic fluid)	<i>110 110 110</i>	<i>JL 25 Apr 2016</i>
WD-40	<i>110 120 120</i>	<i>JL 25 Apr 2016</i>
Mobil Grease 28	<i>110 110 120</i>	<i>JL 25 Apr 2016</i>
Talcum Powder	<i>120 110 110</i>	<i>JL 25 Apr 2016</i>
Abrasive Grit (#4 commercial grade glass bead) <i>wet</i>	<i>110 110 105</i>	<i>JL 25 Apr 2016</i>

CERTIFICATE OF CALIBRATION

371377

Certification Number

Issued By

WESCAN CALIBRATION

Unit#9 - 12240 Horseshoe Way

Richmond, BC V7A 4X9

Ph: (604) 275-0600

Fax: (604) 275-0610



Certification Issued To:

**AERO DESIGN LTD.
9888 A Malaspina Road
Powell River, BC V8A 0G3**

Purchase Order Number:

CREDIT CARD(14061)

Instrument ID: AERO-002

Manufacturer: HANSON

Serial Number: N/A

Date Instrument Calibrated: Aug 19 2014

Laboratory Temperature: 23.3 °C

Type: SCALE, HANGING (0 to 300) lb

Model Number: 8930

Size: (0 to 300) lb

Date Next Calibration Due: Aug 19 2016

Laboratory Humidity: 48 %RH

Calibration Procedure Used: TQ1039

Technician Performing Calibration:

PHILIP H THORNHILL

Calibration Approved By:

GRAHAM SEYMOUR 08/21/2014
Quality Assurance

Calibrated In: WESCAN CALIBRATION VANCOUVER

Wescan Calibration certifies that the above instrument was calibrated in compliance with the requirements of ISO/IEC 17025:2005, and /or the technical requirements of the customer. Wescan's quality management system is aligned with the requirements of ISO 9001:2008. All Wescan Calibration measurements are traceable to SI units through the National Research Council (NRC), the National Institute of Standards and Technology (NIST), other National Measurement Institutes (NMIs), or to physical constants, consensus standards, or ratio measurements. Measured values apply only at the time of calibration. After that time any number of factors may cause measured values to change. The information in this certificate applies only to the identified instrument.

See Attached Data Sheet For Additional Calibration Data

Data Sheet
371377
Certification Number

INSTRUMENT ACCURACY

±1.5 % OF FULL SCALE (±4.5 LBS)

INSTRUMENT CONDITION

FOUND AND LEFT MEETING SPECIFICATION. SEE ATTACHED CALIBRATION DATA.

STANDARDS USED FOR THIS CALIBRATION

Unique ID	Description	Due Date
101035B	WEIGHT, 25 lb (CLASS F)	12/31/2017
101035C	WEIGHT, 50 lb (CLASS F)	03/31/2016
104045A	WEIGHT, 20 kg (CLASS F)	03/31/2016
104045B	WEIGHT, 20 kg (CLASS F)	03/31/2016
104045C	WEIGHT, 20 kg (CLASS F)	03/31/2016
104045D	WEIGHT, 20 kg (CLASS F)	03/31/2016
104046	WEIGHT, 10 kg (CLASS F)	12/31/2017
104052	WEIGHT, 5 kg (CLASS F)	09/30/2017

Traceable Reference:	(101035B)340118	(101035C)315874	(104045A)316033	(104045B)316034
	(104045C)316035	(104045D)316036	(104046)341119	(104052)337355

End of Report

**Wescan**
calibration

Calibration procedure TQ1039
Item type Force gauge (Tension only)
Range 300.0 lb
Accuracy 1.5 % of full scale
Test item resolution 1.0 lb

Test	Nominal	Standard	Lower limit	Test item	Upper limit	% limits used	TUR if <4:1
	% of range	lb	lb	lb	lb		
Tension:	8%	25.0	20.50	25.0	29.5	0.0%	
	17%	50.0	45.50	50.0	54.5	0.0%	
	37%	110.2	105.73	110.0	114.7	-5.1%	
	59%	176.4	171.90	177.5	180.9	24.4%	
	81%	242.5	238.00	245.0	247.0	55.6%	
	92%	274.5	270.00	277.5	279.0	66.7%	

End of calibration data

All points tested met acceptance criteria

CERTIFICATE OF CALIBRATION

371378

Certification Number

Issued By

WESCAN CALIBRATION

Unit#9 - 12240 Horseshoe Way

Richmond, BC V7A 4X9

Ph: (604) 275-0600

Fax: (604) 275-0610



Certification Issued To:

**AERO DESIGN LTD.
9888 A Malaspina Road
Powell River, BC V8A 0G3**

Purchase Order Number:

CREDIT CARD(14061)

Instrument ID: 401008011270

Manufacturer: PELOUZE

Serial Number: 401008011270

Date Instrument Calibrated: Aug 12 2014

Laboratory Temperature: 23.1 °C

Type: BALANCE, DIGITAL PELOUZE 4010

Model Number: 4010

Size: (0 to 68) kg / (0 to 150) lb

Date Next Calibration Due: Aug 12 2016

Laboratory Humidity: 39 %RH

Calibration Procedure Used: M1037

Technician Performing Calibration:

KEN NAZARETH

Calibration Approved By:

MICHELLE HABKIRK 08/13/2014
Operations Manager

Calibrated In: WESCAN CALIBRATION VANCOUVER

Wescan Calibration certifies that the above instrument was calibrated in compliance with the requirements of ISO/IEC 17025:2005, and /or the technical requirements of the customer. Wescan's quality management system is aligned with the requirements of ISO 9001:2008. All Wescan Calibration measurements are traceable to SI units through the National Research Council (NRC), the National Institute of Standards and Technology (NIST), other National Measurement Institutes (NMIs), or to physical constants, consensus standards, or ratio measurements. Measured values apply only at the time of calibration. After that time any number of factors may cause measured values to change. The information in this certificate applies only to the identified instrument.

See Attached Data Sheet For Additional Calibration Data

Data Sheet

371378
Certification Number

INSTRUMENT ACCURACY

±0.2 kg

NOTE: ACCURACY AS PER CUSTOMER (JASON) REQUIREMENT

INSTRUMENT CONDITION

FOUND AND LEFT MEETING SPECIFICATION. SEE ATTACHED CALIBRATION DATA.

STANDARDS USED FOR THIS CALIBRATION

Unique ID	Description	Due Date
103053	WEIGHT SET, 5PC (500 g to 5 kg) CLASS ULTRA	03/31/2015
104045A	WEIGHT, 20 kg (CLASS F)	03/31/2016
104045B	WEIGHT, 20 kg (CLASS F)	03/31/2016
104045C	WEIGHT, 20 kg (CLASS F)	03/31/2016
104046	WEIGHT, 10 kg (CLASS F)	12/31/2017

Traceable Reference: (103053)301690 (104045A)316033 (104045B)316034 (104045C)316035
(104046)341119

End of Report

Scale, digital
Pelouze 4010

As found / As left

Item ID: 401008011270

Preparation for calibration

Exercise balance

Yes

Clean balance

Yes

Verify level

n/a

Linearity



Wescan
calibration

Nominal	Standard	Lower limit	Test item	Upper limit	% limits used	TUR if<4:1
kg	kg	kg	kg	kg		
0.5	0.50	0.3	0.5	0.7	0.0%	
5	5.00	4.8	5.0	5.2	0.0%	
10	10.00	9.8	10.0	10.2	0.0%	
20	20.00	19.8	20.0	20.2	0.0%	
40	40.00	39.8	39.9	40.2	-50.0%	
60	60.00	59.8	59.9	60.2	-50.0%	
68	68.00	67.8	67.9	68.2	-50.0%	

Repeatability

Weight					
1.0 kg	Low range	1.0	1.0	1.0	
10.0 kg	Mid range	10.0	10.0	10.0	
20.0 kg	High range	20.0	20.0	19.9	

End of calibration data

All points tested met acceptance criteria

The Scale Shop (1963) Ltd

107-318 East Kent Avenue South, Vancouver, B.C. V5X 4N6
Phone: 604-322-0345 Fax: 604-325-0887 Email: thescaleshop@telus.net

Certificate of Calibration

This is to certify that the following weigh system:

Make: VIRTUAL MEASUREMENTS & CONTROL

Model: VC-210 / BSS-3K

Serial No: 11134 / 5H261302000315

Capacity: 3000 LB. X 1 LB.

Has been tested on this date of: AUG. 8/20/11 using test apparatus
directly traceable to the National Research Council of Canada.

Calibration Table:

Load: 0

Indication: 0

100 LB.

100 LB.

500 LB.

500 LB.

1000 LB.


1000 LB.

2000 LB.

2000 LB.

3000 LB.

3000 LB.


Service Technician
The Scale Shop (1963) Ltd

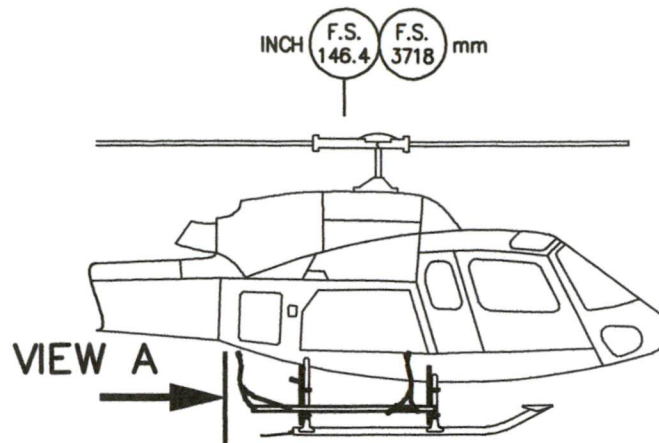
CONFORMITY INSPECTION RECORD

Applicant	Aeronautical Product				Title of Change
Aero Design Ltd.	Make		Model	Serial No.	Registration
	Airbus Helicopters		AS350/AS355	N/A	N/A
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
Installation Drawing 100201, Rev. 0 P/N 100201-01-01 (low mounted, LH)	<i>Jason Behn</i>	25 Apr 16	<i>James Lin</i>	25 Apr 2016	per supplied drawings
Assembly Drawing 100210, Rev. 0 P/N 100210-01-01 (LH Assembly)	<i>Jason Behn</i>	25 Apr 16	<i>James Lin</i>	25 Apr 2016	See additional information below.

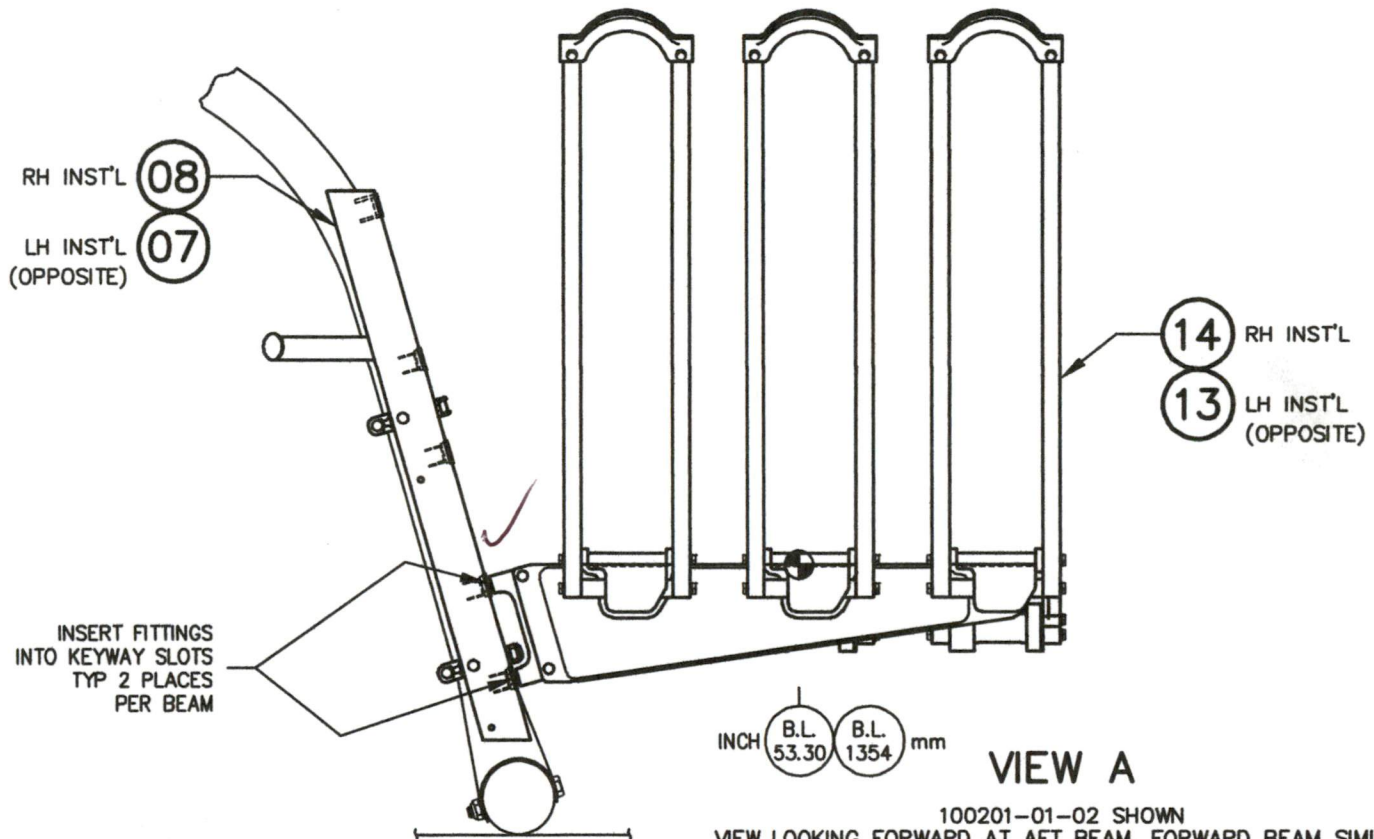
<u>APPLICANT'S ATTESTATION</u>	<u>TC INSPECTION</u> <i>For TCA</i>
<p>I hereby confirm that the prototype installation for the subject</p> <p><input checked="" type="checkbox"/> MODIFICATION,</p> <p><input type="checkbox"/> REPAIR,</p> <p><input type="checkbox"/> TSO/AP-TC ARTICLE</p> <p>is in conformity with the applicable installation drawing(s) listed above and that necessary ground tests have been carried out. [Please check (✓) the applicable box.]</p>	<p><input checked="" type="checkbox"/> ACCEPTABLE</p> <p><input type="checkbox"/> UNACCEPTABLE</p>
<p><u>Additional Information:</u></p> <p>The following discrepancies are noted, but do not affect the results of the load test and the applicable changes will be incorporated into the final drawings.</p> <p>1) 100230-02 Attachment Bracket – extended 5.94" to pick up next higher keyway.</p> <p>2) Dwg. 100210 – AN4-14A bolts used in place of AN4-13A; NAS1149F0463P washers used in place of NAS1149F0432P washers.</p> <p>3) 100220-01 Sliding Frame – 3 of the frames are from an earlier prototype configuration that used a bushing in the inboard hole. This feature has been removed. Critical dimensions remain the same.</p> <p>4) Dwg. 100215 – 100227-01 Placard was not installed.</p> <p>5) Surface finish is not applied to 100225-01 Straps and modified 100230-02 Attachment Bracket (noted above).</p>	<p><u>Remarks:</u></p> <p><i>Good as-is</i></p>

Signature: *Jason Behn* 11795441


Signature: *James Lin* 1208304

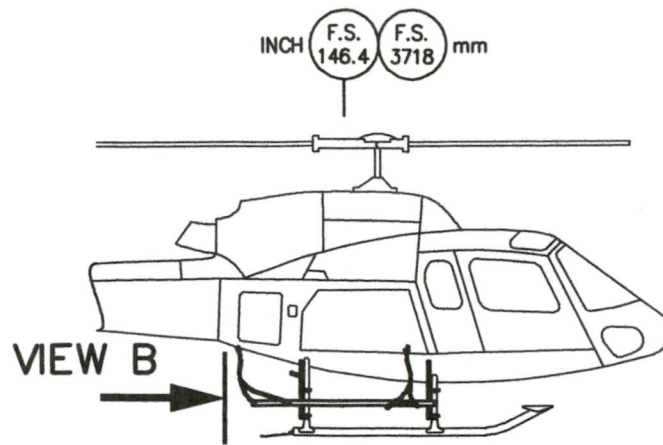


- (02) BICYCLE RACK INSTALLATION – LOW RH
 SHOWN
 (01) BICYCLE RACK INSTALLATION – LOW LH
 OPPOSITE

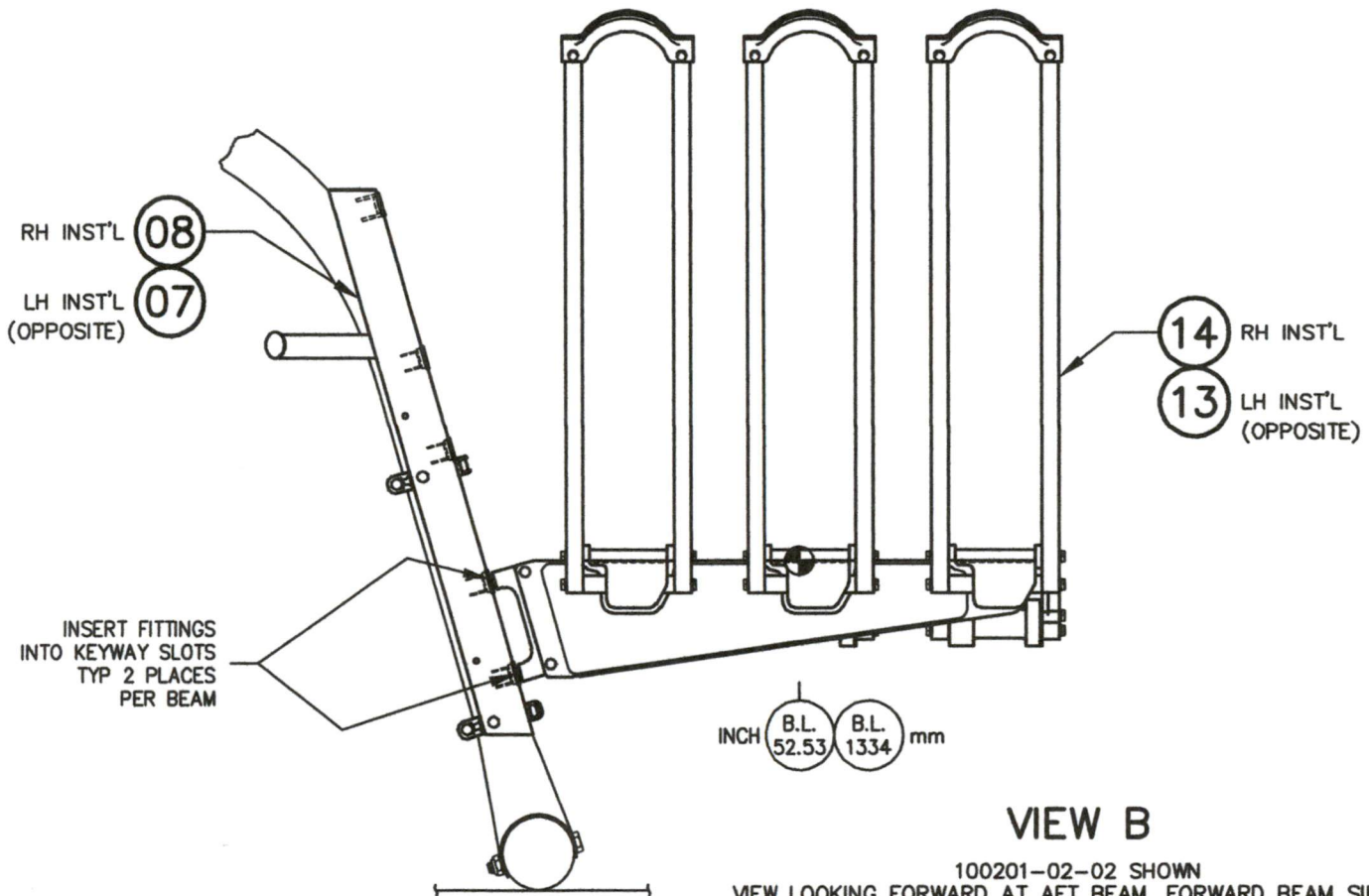


100201-01-02 SHOWN
 VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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NOTICE	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				AIRBUS HELICOPTERS AS350 & AS355 SERIES					
	DECIMALS		ANGLES		QUICK RELEASE BICYCLE RACK					
	X.XXX ±0.010		±1/2"		BICYCLE RACK INSTALLATION (LOW)					
	X.XX ±0.03				NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.	
	X.X ±0.1				SHEET 1 OF 4		A4	100201	0	




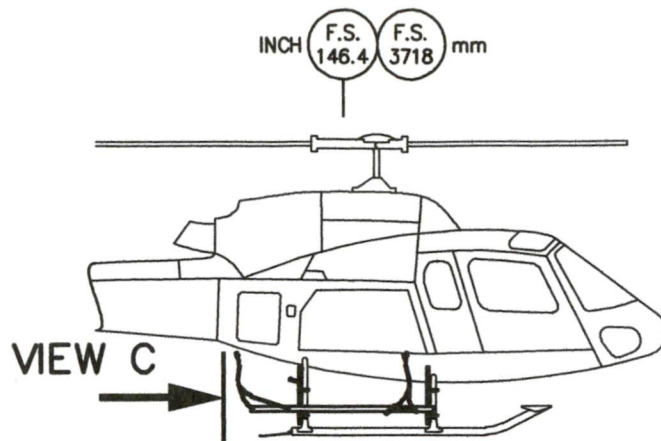
- ④ BICYCLE RACK INSTALLATION – HIGH RH
 SHOWN
 ③ BICYCLE RACK INSTALLATION – HIGH LH
 OPPOSITE



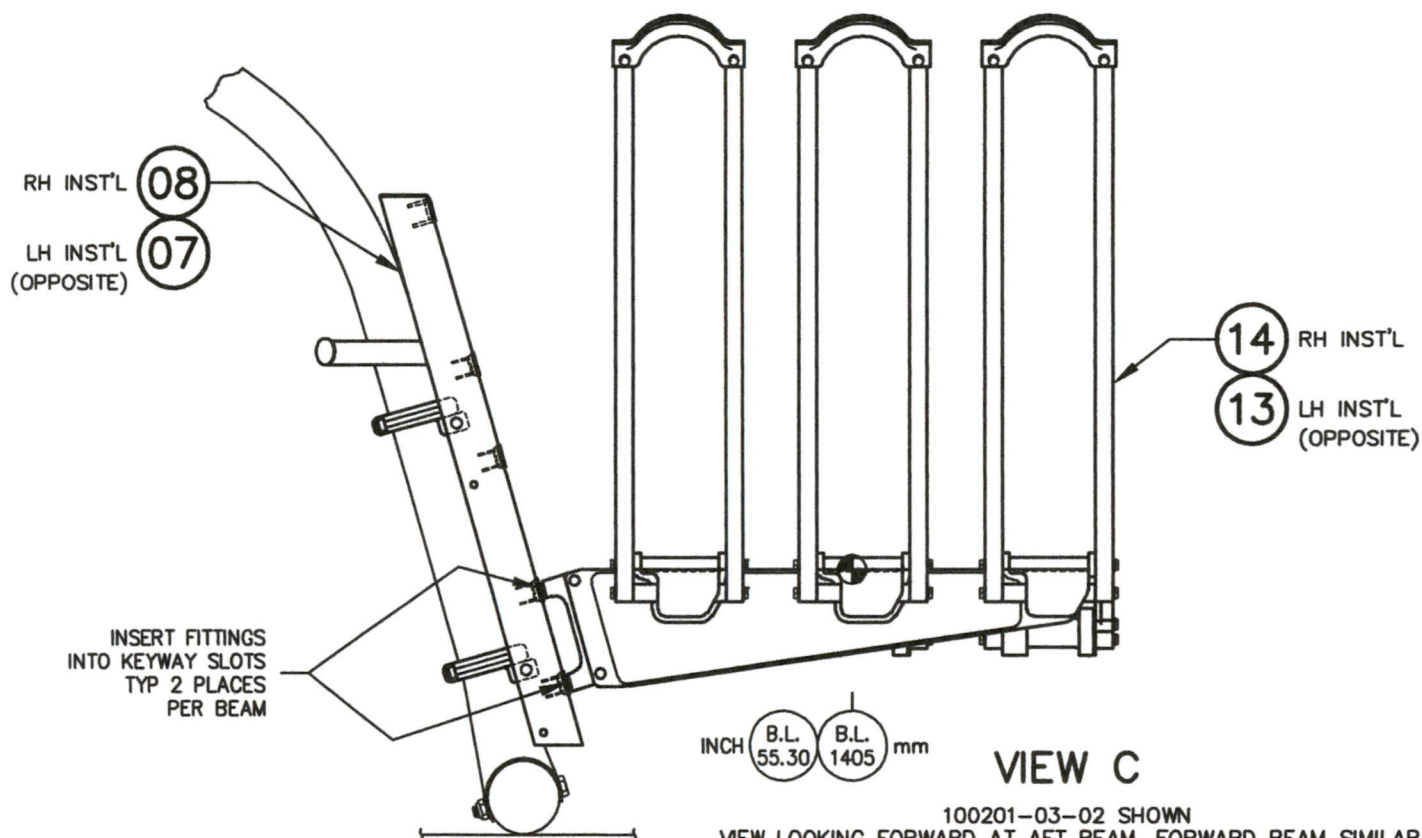
VIEW B

100201-02-02 SHOWN
 VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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					NOT TO SCALE		DWG. SIZE		DWG. NO.		REV.	
					SHEET 2 OF 4		A4		100201		0	



- 06 BICYCLE RACK INSTALLATION – CARGO POD COMPATIBLE RH
 SHOWN
 05 BICYCLE RACK INSTALLATION – CARGO POD COMPATIBLE LH
 OPPOSITE



100201-03-02 SHOWN
 VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	



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AIRBUS HELICOPTERS AS350 & AS355 SERIES
 QUICK RELEASE BICYCLE RACK
 BICYCLE RACK INSTALLATION (POD COMPATIBLE)

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 3 OF 4	A4	100201	0


REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES:

1. ATTACHMENT PROVISIONS INSTALLED IN ACCORDANCE WITH DRAWING 78602 (STANDARD CONFIGURATION) OR 78603 (CARGO POD COMPATIBLE CONFIGURATION) IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION.
2. SEE FLIGHT MANUAL SUPPLEMENT, FMS1002.91, FOR LIMITATIONS ON HELICOPTER OPERATIONS WITH BICYCLE RACK INSTALLED.
3. SEE INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA1002.90, FOR MAINTENANCE AND WEIGHT AND BALANCE INFORMATION.
4. BICYCLE RACK INSTALLATION IN HIGH AND LOW POSITIONS MAY NOT PROVIDE SUFFICIENT CLEARANCE OF BICYCLE HANDLE BARS FROM SIDE CARGO COMPARTMENT EXTENDERS (COMMONLY REFERRED TO AS SQUIRREL CHEEKS OR CARGO PODS). ROTATION OF HANDLE BARS MAY BE REQUIRED.

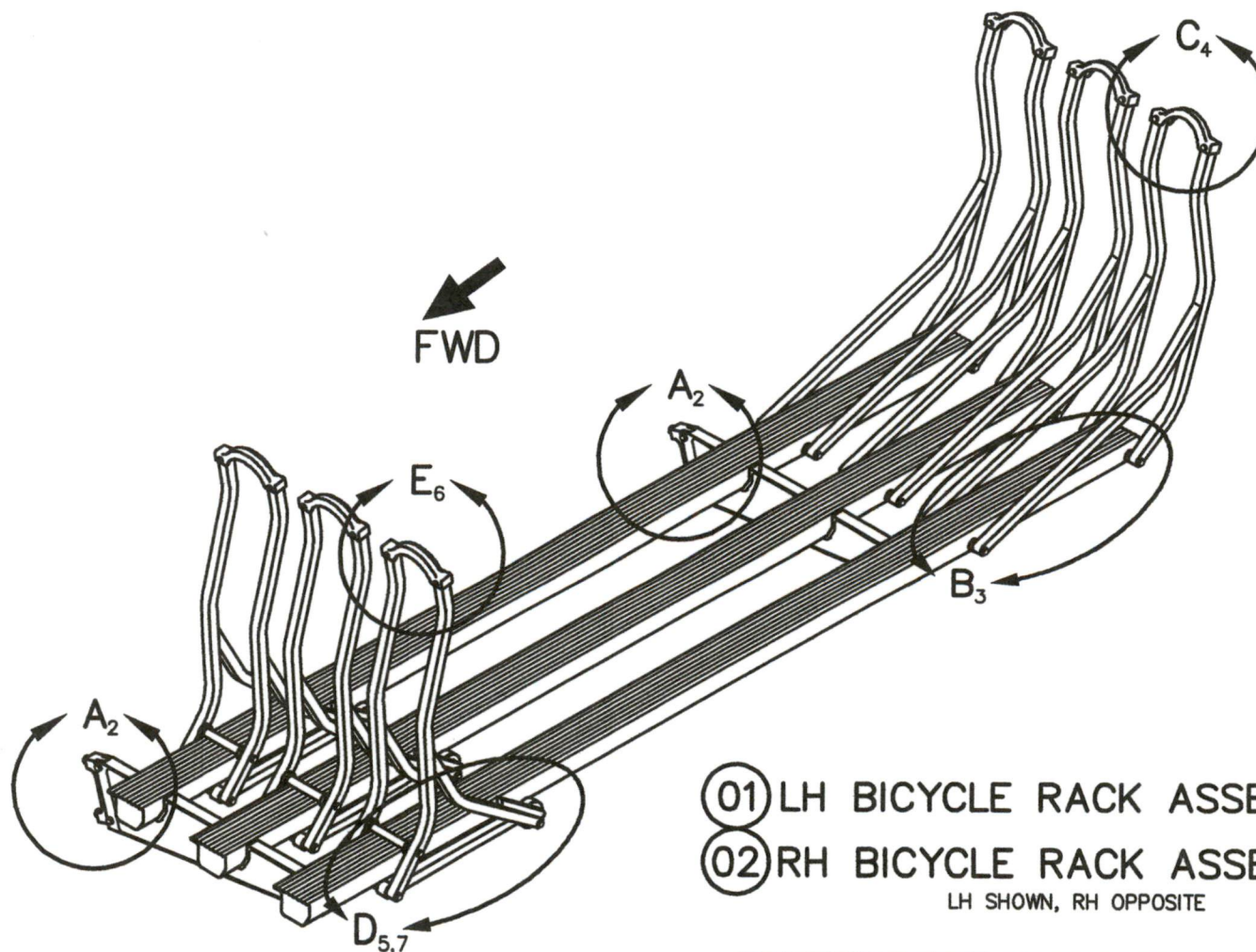
1		1		1		100211-01-02	14	RH BICYCLE RACK ASSEMBLY
	1		1		1	100211-01-01	13	LH BICYCLE RACK ASSEMBLY
1						78603-01-01	12	ATTACHMENT PROVISIONS INSTALLATION (CARGO POD COMPATIBLE - RH)
	1					78603-01-02	11	ATTACHMENT PROVISIONS INSTALLATION (CARGO POD COMPATIBLE - LH)
		1				78602-02-01	10	ATTACHMENT PROVISIONS INSTALLATION (HIGH - RH)
			1			78602-02-02	09	ATTACHMENT PROVISIONS INSTALLATION (HIGH - LH)
				1		78602-01-01	08	ATTACHMENT PROVISIONS INSTALLATION (LOW - RH)
					1	78602-01-02	07	ATTACHMENT PROVISIONS INSTALLATION (LOW - LH)
						100201-03-02	06	BICYCLE RACK INSTALLATION (CARGO POD COMPATIBLE - RH)
						100201-03-01	05	BICYCLE RACK INSTALLATION (CARGO POD COMPATIBLE - LH)
						100201-02-02	04	BICYCLE RACK INSTALLATION (HIGH - RH)
						100201-02-01	03	BICYCLE RACK INSTALLATION (HIGH - LH)
						100201-01-02	02	BICYCLE RACK INSTALLATION (LOW - RH)
						100201-01-01	01	BICYCLE RACK INSTALLATION (LOW - LH)

QTY	QTY	QTY	QTY	QTY	QTY	PART NO.	ITEM	DESCRIPTION
LIST OF MATERIALS								


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	DECIMALS		ANGLES				NOT TO SCALE		DWG. SIZE		DWG. NO.		REV.
X.XXX ±0.010		±1/2°				SHEET 4 OF 4		A4		100201		0	
X.XX ±0.03													
X.X ±0.1													

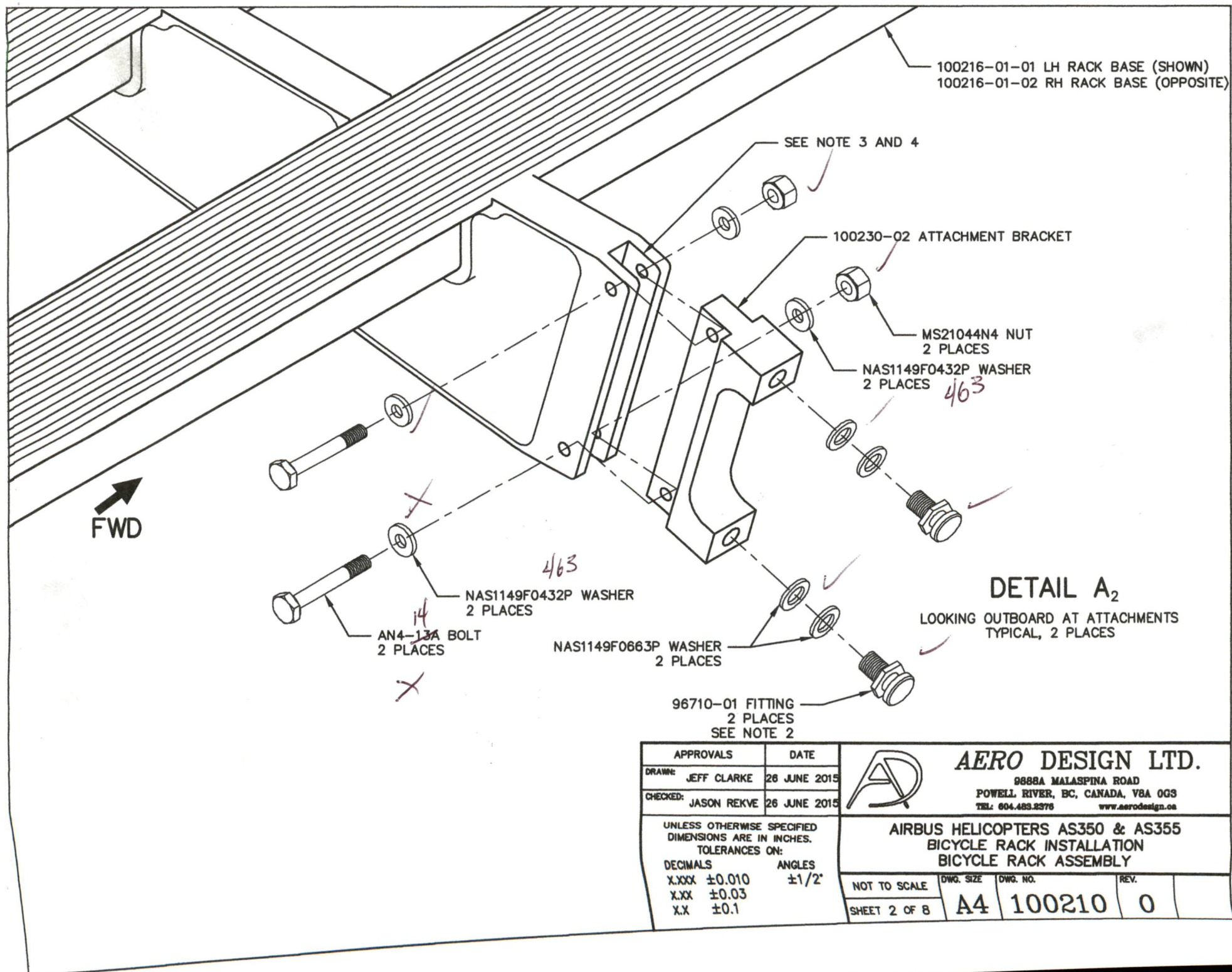
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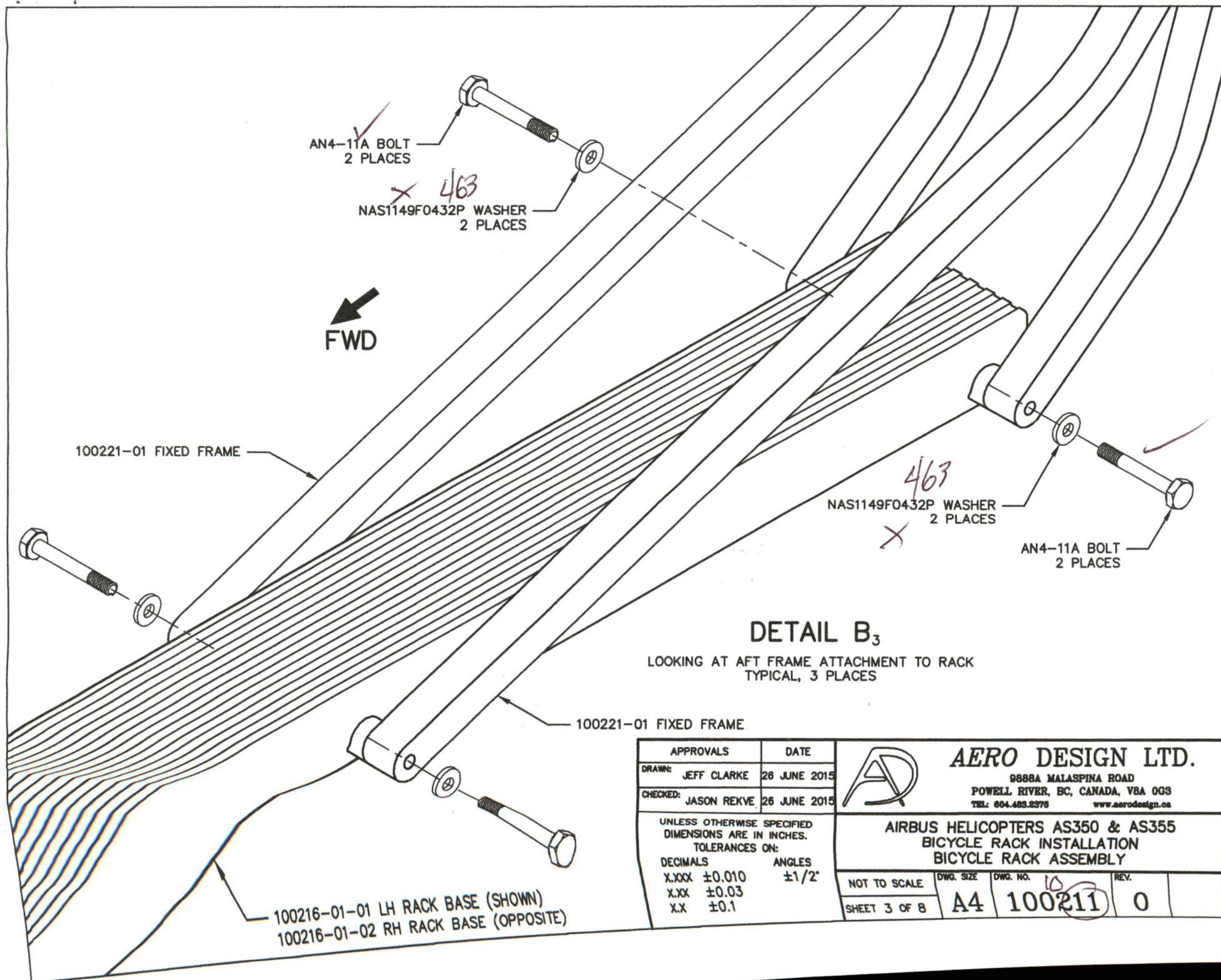


- (01) LH BICYCLE RACK ASSEMBLY
 (02) RH BICYCLE RACK ASSEMBLY
 LH SHOWN, RH OPPOSITE

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NOT TO SCALE				DWG. SIZE	DWG. NO.		REV.
SHEET 1 OF 8				A4	100210		0



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				NOT TO SCALE		DWG. SIZE	DWG. NO.
SHEET 2 OF 8		A4	100210	0			



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NOT TO SCALE		DWG. SIZE	DWG. NO. 100211	REV. 0
SHEET 3 OF 8		A4	100211	0

NAS1149F0363P WASHER
2 PLACES

AN3-13A BOLT
2 PLACES

NAS1149F0363P WASHER
2 PLACES

MS21044N3 NUT
2 PLACES

100221-01 FIXED FRAME

100225-01 STRAP
SEE NOTE 6

100221-01 FIXED FRAME

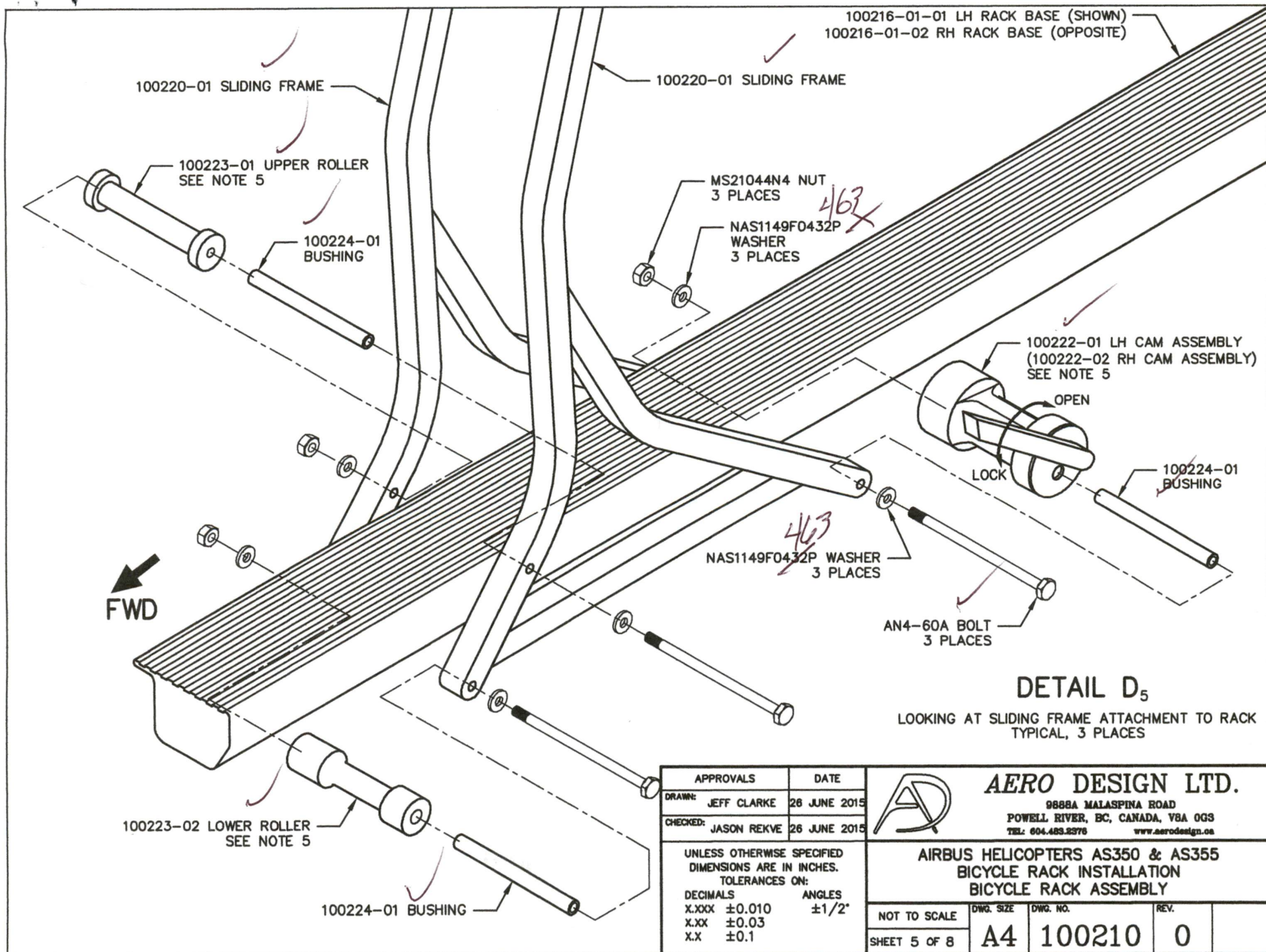
FWD

Bushing on 3

DETAIL C₄

LOOKING AT STRAP INSTALLATION ON AFT FRAME
TYPICAL, 3 PLACES

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NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.
SHEET 4 OF 8		A4	100210	0



APPROVALS	DATE
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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

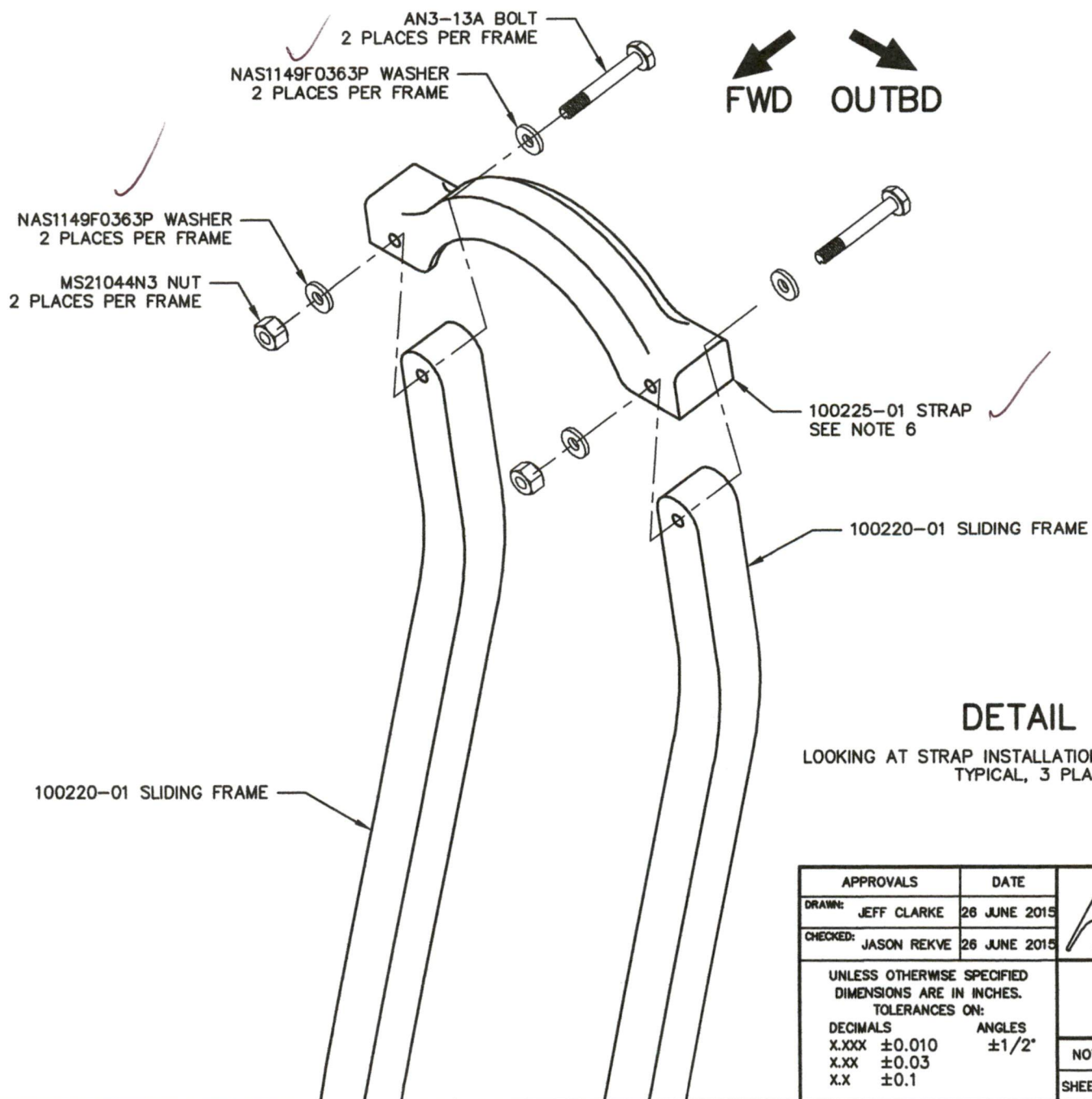


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AIRBUS HELICOPTERS AS350 & AS355
BICYCLE RACK INSTALLATION
BICYCLE RACK ASSEMBLY

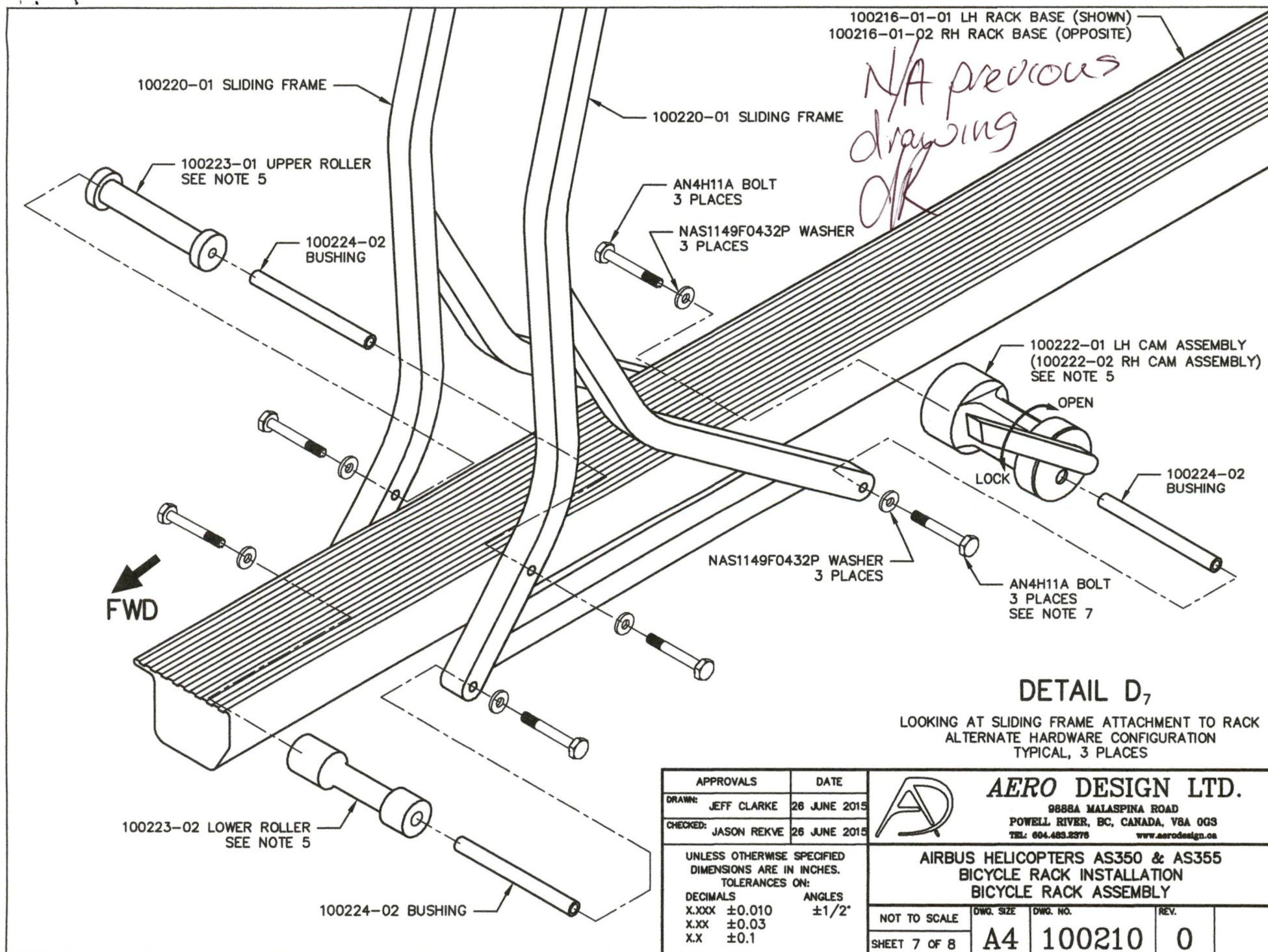
NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 5 OF 8	A4	100210	0




DETAIL E₆

LOOKING AT STRAP INSTALLATION ON MOVING FRAME
TYPICAL, 3 PLACES

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NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.
SHEET 6 OF 8		A4	100210	0




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NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.
SHEET 7 OF 8		A4	100210	0

NOTES

1. INSTALL ALL HARDWARE USING STANDARD SHOP PRACTICES AS OUTLINED IN AC43.13-1B, CHAPTER 7 "AIRCRAFT HARDWARE, CONTROL CABLES, AND TURNBUCKLES" OR STANDARD AIRCRAFT WORKERS MANUAL, SECTION 7 "SHOP PRACTICES".
2. APPLY NICKEL BASED ANTI-SEIZE COMPOUND TO THREADS OF FITTING ON INSTALLATION.
3. ANY PAINT OR POWDER COAT THAT PREVENTS INSTALLATION OF ATTACHMENT BRACKET MAY BE REMOVED WITH SCOTCH BRITE. APPLY ALODINE TO UN-COATED AREAS PRIOR TO ASSEMBLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
4. APPLY MASTINOX 6856K, TECTYL 894, OR EQUIVALENT CORROSION PREVENTATIVE COMPOUND TO FLANGE OF ATTACHMENT BRACKET AND BEAM SLOT PRIOR TO ASSEMBLY.
5. ENSURE ROLLERS ARE FREE TO ROTATE WITH CAM OPEN AND FRAME SLIDES ALONG RAIL. ENSURE CAM ROTATES TO LOCKED POSITION WITH LEVER PARALLEL TO FRAME. ENSURE FRAME CANNOT SLIDE ON RAIL WHEN CAM IS IN LOCKED POSITION.
6. ANY PAINT OR POWDER COAT THAT PREVENTS INSTALLATION OF STRAP MAY BE REMOVED WITH SCOTCH BRITE. APPLY ALODINE TO UN-COATED AREAS PRIOR TO ASSEMBLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. SAFETY WIRE BOLT HEADS IN ACCORDANCE WITH AC43.13-1B, CHAPTER 7, SECTION 7, USING 0.032 STAINLESS STEEL WIRE.
8. TORQUE AN3 BOLTS TO 12-15 IN-LBS (1.4-1.7 N-m).
TORQUE AN4 BOLTS TO 30-40 IN-LBS (3.4-4.5 N-m).
TORQUE 96710-01 FITTINGS TO 160-190 IN-LBS (18.1-21.5 N-m).

12	12	MS21044N3	NUT
24	24	NAS1149F0363P	WASHER
12	12	AN3-13A	BOLT
13	13	MS21044N4	NUT
38	38	NAS1149F0432P	WASHER
9	9	AN4-60A	BOLT
4	4	AN4-13A	BOLT
(18)	(18)	AN4H11A	BOLT (ALTERNATE, SEE SHEET 7)
12	12	AN4-11A	BOLT
8	8	NAS1149F0663P	WASHER
4	4	96710-01	FITTING (ALT: ANCRA 40088-14)
(9)	(9)	100224-02	BUSHING (ALTERNATE, SEE SHEET 7)
9	9	100224-01	BUSHING
3	3	100223-02	LOWER ROLLER
3	3	100223-01	UPPER ROLLER
3		100222-02	RH CAM ASSEMBLY
	3	100222-01	LH CAM ASSEMBLY
6	6	100220-01	SLIDING FRAME
6	6	100225-01	STRAP
6	6	100221-01	FIXED FRAME
2	2	100230-02	ATTACHMENT BRACKET
1		100215-01-02	RH RACK BASE
	1	100215-01-01	LH RACK BASE
		100210-01-02	02 RH BICYCLE RACK ASSEMBLY
		100210-01-01	01 LH BICYCLE RACK ASSEMBLY
02	01	PART NO.	ITEM DESCRIPTION
QTY	QTY	LIST OF MATERIALS	

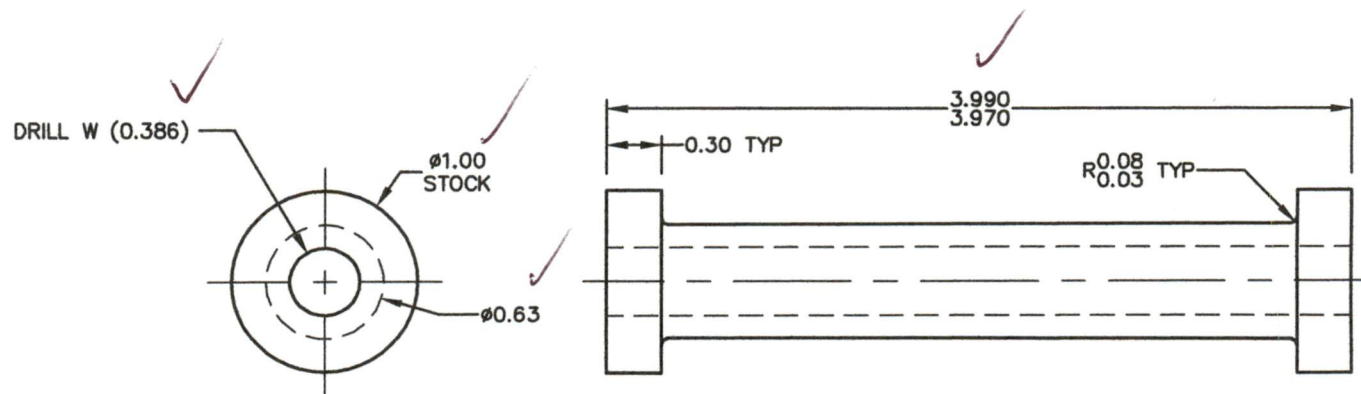
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NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.			
SHEET 8 OF 8		A4	100210	0			

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



(01) UPPER ROLLER

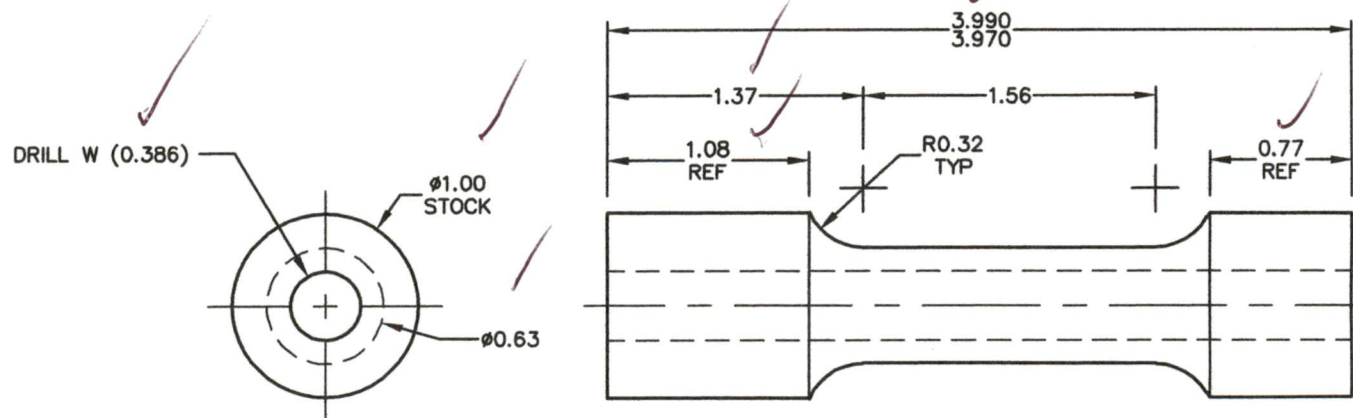
	100223-01	01	UPPER ROLLER	BLACK ACETAL	ASTM D6778	1.0 ROD	
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE	
QTY	LIST OF MATERIALS						
	APPROVALS		DATE		AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca		
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				SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
				SHEET 1 OF 2	A4	100223	0

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

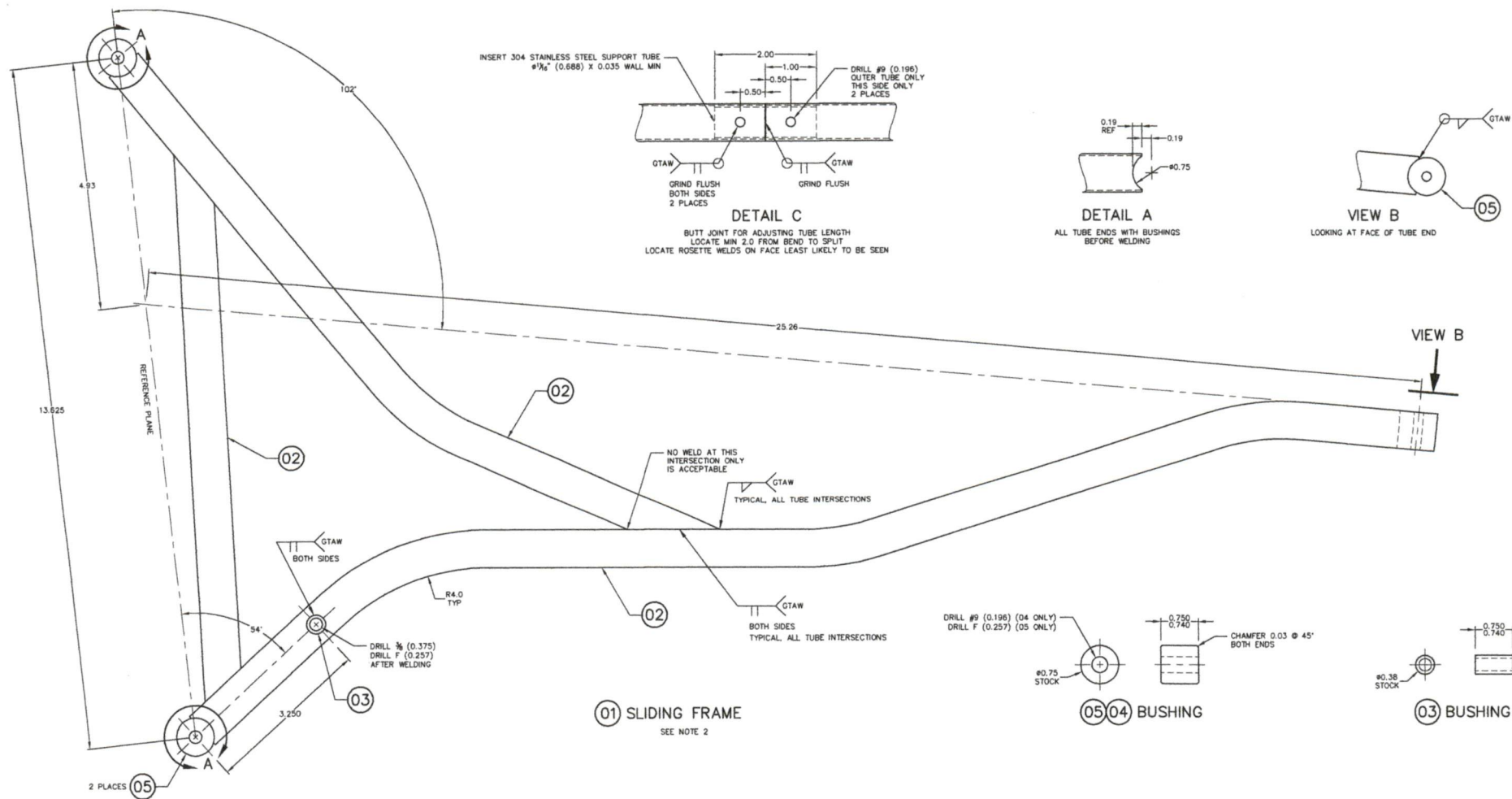
1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



(02) LOWER ROLLER

	100223-02	02	LOWER ROLLER	BLACK ACETAL	ASTM D6778	1.0 ROD
02	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
	APPROVALS		DATE	 <div>AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca</div>		
	DRAWN:	JEFF CLARKE	04 SEPT 2015			
	CHECKED:	JASON REKVE	04 SEPT 2015			
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1			AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION ROLLER FABRICATION		
				SCALE 1 : 1	DWG. SIZE	DWG. NO.
			SHEET 2 OF 2	A4	100223	0

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REV	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. USE FULL SCALE DRAWING AS TEMPLATE. CRITICAL DIMENSIONS SHOWN. INDIVIDUAL TUBE LOCATIONS AND ANGLES MAY VARY UP TO 1/16" (0.06) SO LONG AS CRITICAL DIMENSIONS ARE MAINTAINED. ENSURE BATCHED PARTS ARE IDENTICAL TO EACH OTHER. BUTT JOINTS MAY BE USED TO ACHIEVE REQUIRED LENGTHS, SEE DETAIL C.
3. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.
4. FINISH - STAINLESS STEEL PARTS: FRAME MAY BE POLISHED USING SCOTCH BRITE, WITH NO FURTHER COATING. ALTERNATE: THOROUGHLY DEGRADE AND POWDER COAT. ALTERNATE: THOROUGHLY DEGRADE, EPOXY PRIME AND POLYURETHANE PAINT.

2	100220-05	05	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	100220-04	04	BUSHING (0.75 X 0.199 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	100220-03	03	BUSHING (0.375 X 0.245 ID)	304 STAINLESS STEEL	ASTM A269	#0.375 X 0.065 TUBE
A/R	--	02	TUBE	304 STAINLESS STEEL	ASTM A554	0.75 X 0.035 SQR TUBE
01	100220-01	01	SLIDING FRAME			
QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
LIST OF MATERIALS						
APPROVALS			DATE			
DRAWN: JEFF CLARKE			04 SEPT 2015			
CHECKED: JASON REKVE			04 SEPT 2015			
UNLESS OTHERWISE SPECIFIED			DIMENSIONS ARE IN INCHES.			
TOLERANCES ON:			DECIMALS			
X.XXX			±0.010			
X.XX			±0.03			
X.X			±0.1			
ANGLES			±1/2°			
SCALE 1 : 1			DWG SIZE	DWG NO.	REV.	
SHEET 1 OF 1			A1	100220	0	

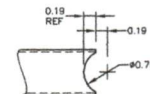
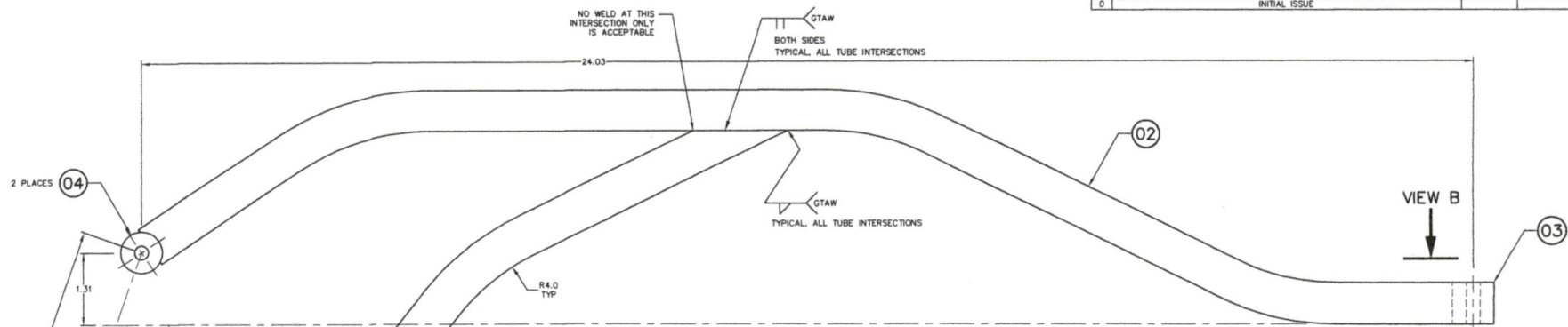


AERO DESIGN LTD.

9886A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 250.483.3978 www.aerodesign.ca

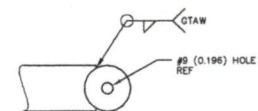
AIRBUS HELICOPTERS AS350/AS355/EC130
BICYCLE RACK INSTALLATION
SLIDING FRAME FABRICATION

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REV	DESCRIPTION OF CHANGE	INITIALS	DATE
D	INITIAL ISSUE		



DETAIL A

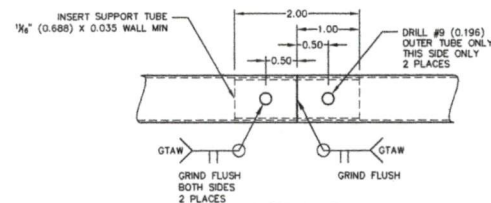
ALL TUBE ENDS WITH BUSHINGS
BEFORE WELDING



VIEW B

LOOKING AT FACE OF TUBE END

01 FIXED FRAME
SEE NOTE 2




DETAIL C

BUTT JOINT FOR ADJUSTING TUBE LENGTH
LOCATE MIN 2.0 FROM BEND TO SPLIT
LOCATE ROSETTE WELDS ON FACE LEAST LIKELY TO BE SEEN

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. USE FULL SCALE DRAWING AS TEMPLATE. CRITICAL DIMENSIONS SHOWN. INDIVIDUAL TUBE LOCATIONS AND ANGLES MAY VARY UP TO 1/16" (0.06) SO LONG AS CRITICAL DIMENSIONS ARE MAINTAINED. ENSURE BATCHED PARTS ARE IDENTICAL TO EACH OTHER. BUTT JOINTS MAY BE USED TO ACHIEVE REQUIRED LENGTHS, SEE DETAIL C.
3. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.
4. FINISH - STAINLESS STEEL PARTS:
FRAME MAY BE POLISHED USING SCOTCH BRITE WITH NO FURTHER COATING.
ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT.
ALTERNATE: THOROUGHLY DEGREASE, EPOXY PRIME AND POLYURETHANE PAINT.

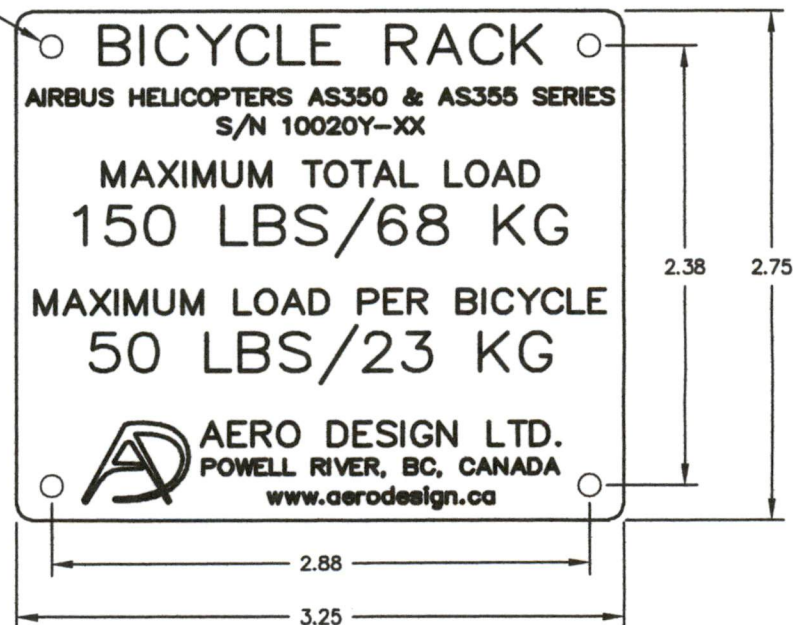
2	100220-06	04	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	Ø0.75 ROD
1	100220-05	03	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	Ø0.75 ROD
A/R	--	02	TUBE	304 STAINLESS STEEL	ASTM A554	0.75 X 0.035 SQR TUBE
	100221-01	01	FIXED FRAME			
QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
LIST OF MATERIALS						
APPROVALS				DATE		
DRAWN: JEFF CLARKE				04 SEPT 2015		
CHECKED: JASON REKVE				04 SEPT 2015		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				 <div>AERO DESIGN LTD. 8888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 804.485.3376 www.aerodesign.ca</div> <div>AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION FIXED FRAME FABRICATION</div>		
DECIMALS		ANGLES				
X.XXX ±0.010		±1/2°				
X.XX ±0.03						
X.X ±0.1						
SCALE 1 : 1				DWG. SIZE		DWG. NO.
SHEET 1 OF 1				A1		100221
						0

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

- ENGRAVE 0.007 DEEP AS FOLLOWS:
 "BICYCLE RACK" - 0.2 HIGH
 "AIRBUS HELICOPTERS AS350 & AS355 SERIES" - 0.080 HIGH
 "S/N 10020Y-XX" - 0.080 HIGH
 Y: 1 = LEFT (-01), 2 = RIGHT (-02)
 XX: SEQUENTIAL NUMBER
 "MAXIMUM TOTAL LOAD" - 0.125 HIGH
 "150 LBS/68 KG" - 0.200 HIGH
 "MAXIMUM LOAD PER BICYCLE" - 0.125 HIGH
 "50 LBS/23 KG" - 0.200 HIGH
 "AERO DESIGN LTD." - 0.125 HIGH
 "POWELL RIVER, BC, CANADA" - 0.080 HIGH
 "www.aerodesign.ca" - 0.080 HIGH


DRILL #30 (0.129)
4 PLACES



01 02 PLACARD

100227-02	02	PLACARD (AS350 RIGHT)	6061-T6 ALUMINUM	QQ-A-250/11	0.050 SHEET
100227-01	01	PLACARD (AS350 LEFT)	6061-T6 ALUMINUM	QQ-A-250/11	0.050 SHEET
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

LIST OF MATERIALS

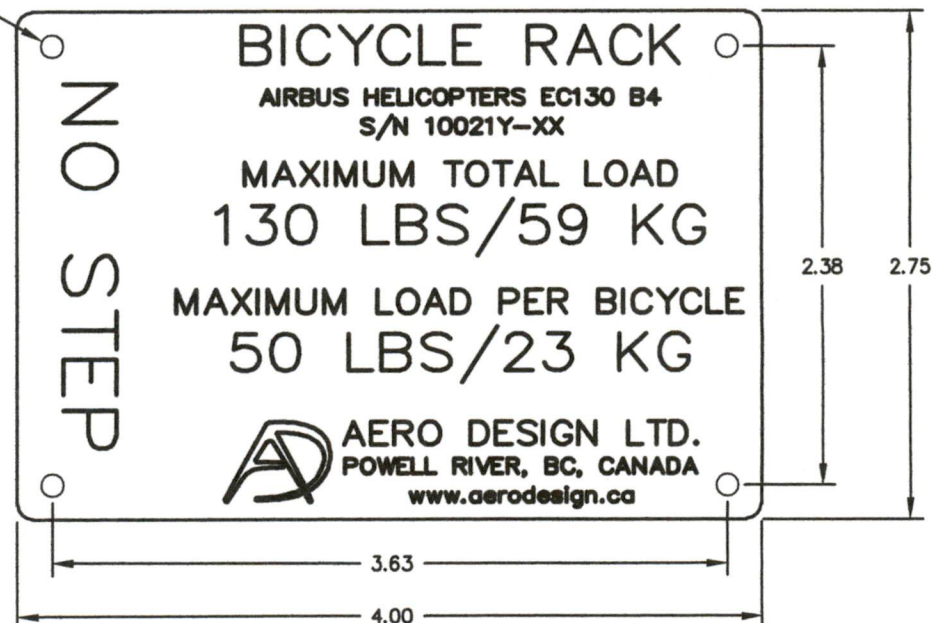
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	DRAWN: JEFF CLARKE		04 SEPT 2015			9888A MALASPINA ROAD						
	CHECKED: JASON REKVE		04 SEPT 2015			POWELL RIVER, BC, CANADA, V8A 0G3						
					TEL: 604.483.2376							
					www.aerodesign.ca							
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1					AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION PLACARD							
					SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.	
					SHEET 1 OF 2		A4		100227		0	

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

- ENGRAVE 0.007 DEEP AS FOLLOWS:
 "BICYCLE RACK" - 0.2 HIGH
 "AIRBUS HELICOPTERS EC130 B4" - 0.080 HIGH
 "S/N 10020Y-XX" - 0.080 HIGH
 Y: 1 = LEFT (-11), 2 = RIGHT (-12)
 XX: SEQUENTIAL NUMBER
 "MAXIMUM TOTAL LOAD" - 0.125 HIGH
 "130 LBS/59 KG" - 0.200 HIGH
 "MAXIMUM LOAD PER BICYCLE" - 0.125 HIGH
 "50 LBS/23 KG" - 0.200 HIGH
 "AERO DESIGN LTD." - 0.125 HIGH
 "POWELL RIVER, BC, CANADA" - 0.080 HIGH
 "www.aerodesign.ca" - 0.080 HIGH

DRILL #30 (0.129)
4 PLACES




11 12 PLACARD

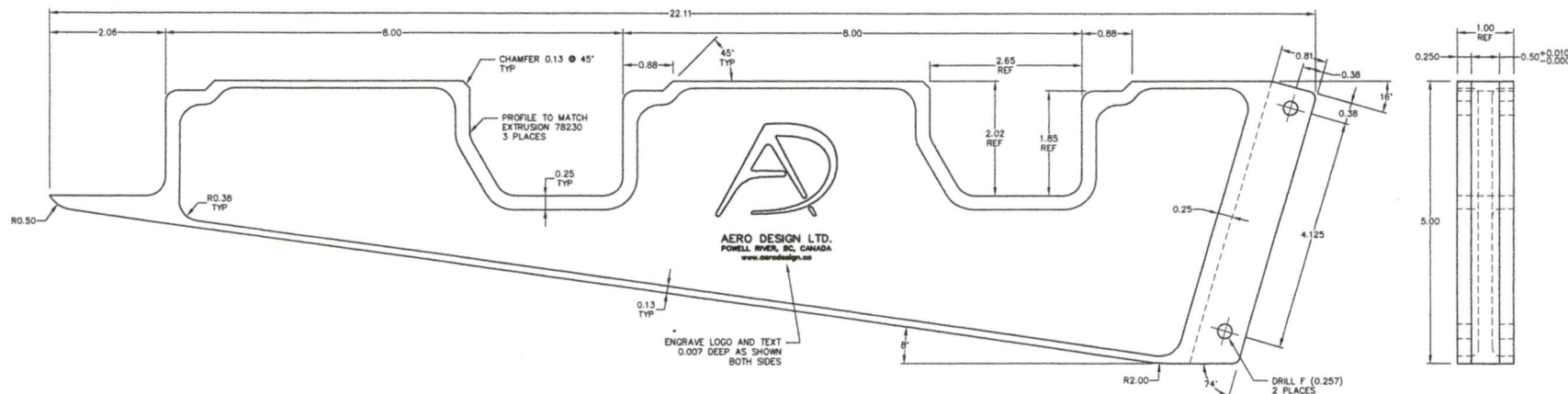
11 SHOWN, 12 OPPOSITE

N/A

100227-12	12	PLACARD (EC130 RIGHT)	6061-T6 ALUMINUM	QQ-A-250/11	0.050 SHEET
100227-11	11	PLACARD (EC130 LEFT)	6061-T6 ALUMINUM	QQ-A-250/11	0.050 SHEET
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

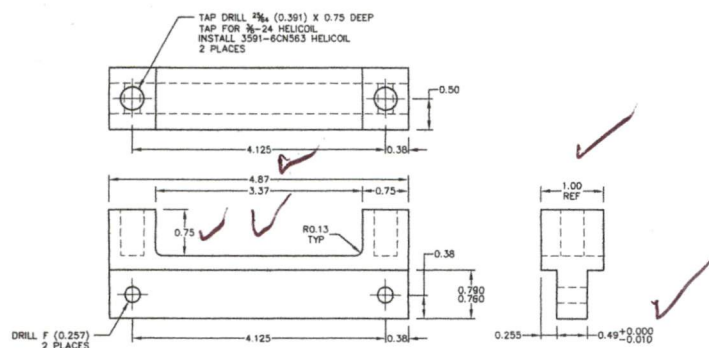
LIST OF MATERIALS

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	DRAWN: JEFF CLARKE		04 SEPT 2015			9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca			
	CHECKED: JASON REKVE		04 SEPT 2015			AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION PLACARD			
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1								
		SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.	
		SHEET 2 OF 2		A4		100227		0	



① BEAM

PART TO BE CNC MACHINED USING THIS DRAWING AS A TEMPLATE




② ATTACHMENT BRACKET

extend

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES

2	3591-60M563	SELF-LOOKING HELICOIL		6061-T6 ALUMINUM	QQ-A-200/8	4 X 1 FLAT BAR																
	100230-02	02	ATTACHMENT BRACKET	6061-T6 ALUMINUM	QQ-A-200/8	8 X 1 FLAT BAR																
02	100230-01	01	BEAM	MATERIAL	MATERIAL SPEC	STOCK SIZE																
QTY	QTY	LIST OF MATERIALS																				
<table><tr><td colspan="2">APPROVALS</td><td>DATE</td></tr><tr><td>DRAWN:</td><td>JEFF CLARKE</td><td>04 SEPT 2015</td></tr><tr><td>CHECKED:</td><td>JASON REKVE</td><td>04 SEPT 2015</td></tr></table>				APPROVALS		DATE	DRAWN:	JEFF CLARKE	04 SEPT 2015	CHECKED:	JASON REKVE	04 SEPT 2015	 <div>AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL. 604.463.3376 www.aerodesign.ca</div>									
APPROVALS		DATE																				
DRAWN:	JEFF CLARKE	04 SEPT 2015																				
CHECKED:	JASON REKVE	04 SEPT 2015																				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				AIRBUS HELICOPTERS AS350/AS355, EC130 BICYCLE RACK INSTALLATION BEAM FABRICATION																		
<table><tr><td>DECIMALS</td><td>ANGLES</td></tr><tr><td>X.XXX ± 0.010</td><td>$\pm 1/2^\circ$</td></tr><tr><td>X.XX ± 0.03</td><td></td></tr><tr><td>X.X ± 0.1</td><td></td></tr></table>				DECIMALS	ANGLES	X.XXX ± 0.010	$\pm 1/2^\circ$	X.XX ± 0.03		X.X ± 0.1		<table><tr><td>SCALE 1 : 1</td><td>DWG. SIZE</td><td>DWG. NO.</td><td>REV.</td></tr><tr><td>SHEET 1 OF 1</td><td>A1</td><td>100230</td><td>0</td></tr></table>			SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.	SHEET 1 OF 1	A1	100230	0
DECIMALS	ANGLES																					
X.XXX ± 0.010	$\pm 1/2^\circ$																					
X.XX ± 0.03																						
X.X ± 0.1																						
SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.																			
SHEET 1 OF 1	A1	100230	0																			



1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF 60XX ALUMINUM TO BE COMPLETED BY GTAW METHOD TO AWS2885C. WELDING ROD SHALL CONFORM TO ANSI/AWS ER4043.
3. FINISH, ALUMINUM PARTS - AFTER WELDING:
THOROUGHLY DEGREASE, ALDOLINE, EPOXY PRIME AND POLYURETHANE PAINT.
ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT.
INSTALL PLACARD AFTER SURFACE FINISH IS DRY.



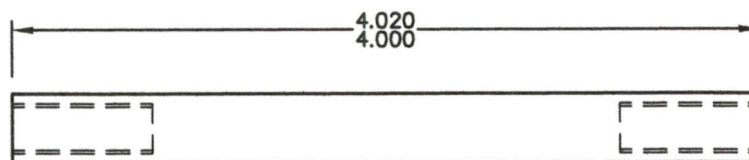
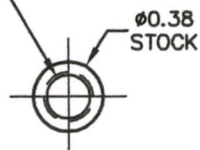
QTY	QTY	QTY	QTY	LIST OF MATERIALS
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[illegible]

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

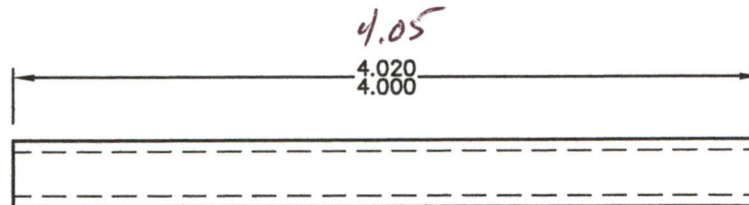
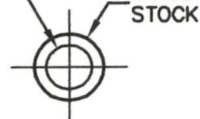
TAP DRILL $1\frac{1}{4}$ (0.266) X 0.75 DEEP
TAP FOR 1/4-28 HELICOIL
INSTALL 3591-4CN375 HELICOIL
BOTH ENDS



N/A not used
OK

② BUSHING


DRILL F (0.257)



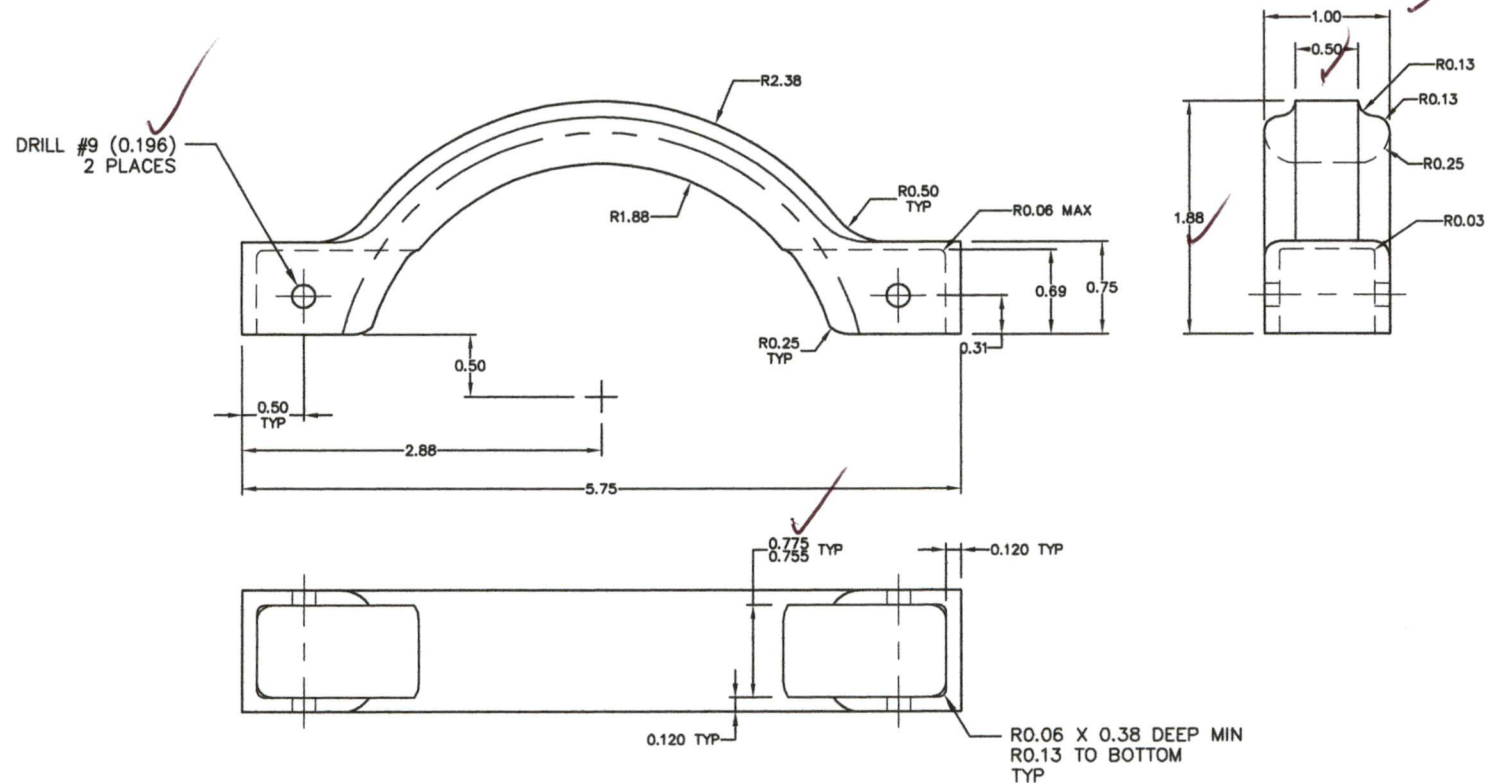
① BUSHING

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

2		3591-4CN375		SELF-LOCKING HELICOIL			
		100224-02	02	BUSHING	304 STAINLESS STEEL	ASTM A479	Ø0.375 ROD
		100224-01	01	BUSHING	304 STAINLESS STEEL	ASTM A269	Ø0.375 X 0.065 TUBE
02	01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	QTY	LIST OF MATERIALS					
				APPROVALS	DATE	 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 804.483.2376 www.aerodesign.ca	
				DRAWN: JEFF CLARKE	15 JUNE 2015		
				CHECKED: JASON REKVE	16 JUNE 2015		
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1		AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION BUSHING FABRICATION	
				SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
				SHEET 1 OF 1	A4	100224	0


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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



① STRAP

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. FINISH - ALUMINUM PARTS:
THOROUGHLY DEGREASE AND POWDER COAT.
ALTERNATE: THOROUGHLY DEGREASE, ALODINE, EPOXY PRIME AND POLYURETHANE PAINT.
ALTERNATE: ANODIZE IN ACCORDANCE WITH MIL-A-8625F, TYPE II.

100225-01 01 STRAP		6061-T6 ALUMINUM		QQ-A-200/B		2 X 1 BAR		
PART NO.		ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE		
QTY	LIST OF MATERIALS							
<div>APPROVALS</div> <div>DATE</div> <div>DRAWN: JEFF CLARKE 04 SEPT 2013</div> <div>CHECKED: JASON REKVE 04 SEPT 2013</div>		<div></div> <div>AERO DESIGN LTD.</div> <div>9888A MALASPINA ROAD</div> <div>POWELL RIVER, BC, CANADA, V8A 0G3</div> <div>TEL: 804.488.8978</div> <div>www.aerodesign.ca</div>		<div>AIRBUS HELICOPTERS AS350/AS355/EC130</div> <div>BICYCLE RACK INSTALLATION</div> <div>STRAP FABRICATION</div>				
							UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
							TOLERANCES ON:	
DECIMALS		ANGLES		SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.	
X.XXX ±0.010		±1/2°		SHEET 1 OF 1	A3	100225	0	
X.XX ±0.03								
X.X ±0.1								

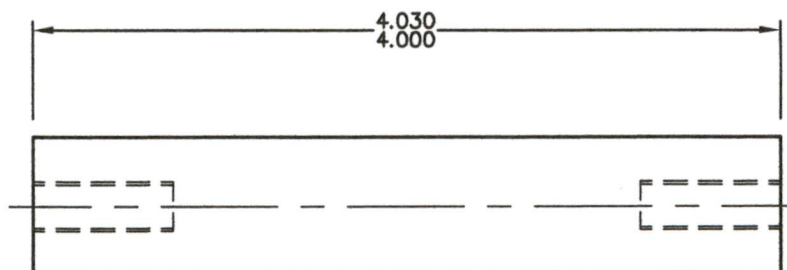
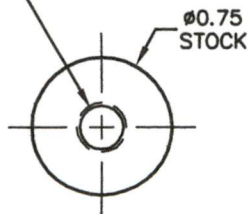
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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		


NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

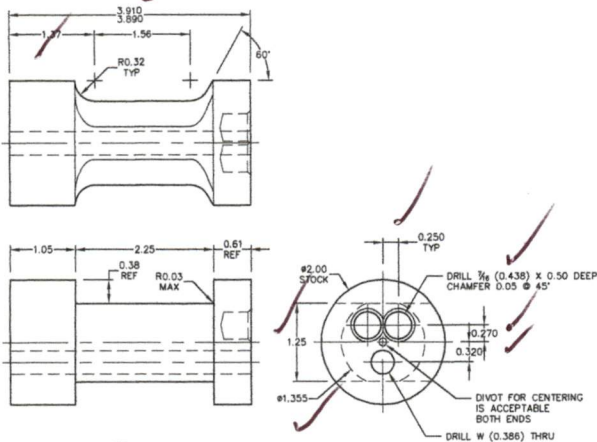
TAP DRILL $1\frac{7}{64}$ (0.266) X 0.75 DEEP
TAP FOR 1/4-28 HELICOIL
INSTALL 3591-4CN375 HELICOIL
BOTH ENDS



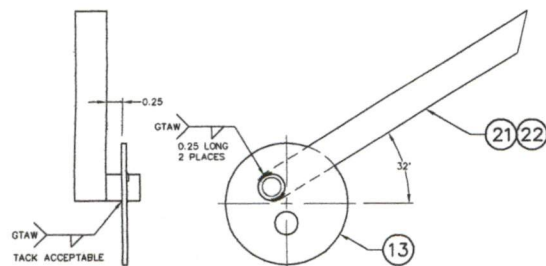
(01) RACK BUSHING

2	3591-4CN375	02	SELF-LOCKING HELICOIL			
	100226-01	01	RACK BUSHING	6061-T6 ALUMINUM	QQ-A-200/8	0.75 ROD
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
		APPROVALS	DATE	<div><div><div>AERO DESIGN LTD.</div><div>9888A MALASPINA ROAD</div><div>POWELL RIVER, BC, CANADA, V8A 0G3</div><div>TEL: 604.483.2376 www.aerodesign.ca</div></div></div>		
		DRAWN: JEFF CLARKE	15 JUNE 2015			
		CHECKED: JASON REKVE	16 JUNE 2015			
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				
AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION RACK BUSHING FABRICATION						
SCALE 1 : 1				DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1				A4	100226	0

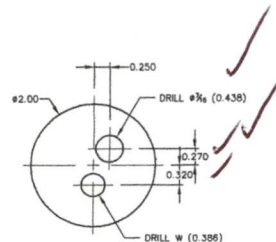
REV		DESCRIPTION OF CHANGE	INITIALS	DATE
0		INITIAL ISSUE		



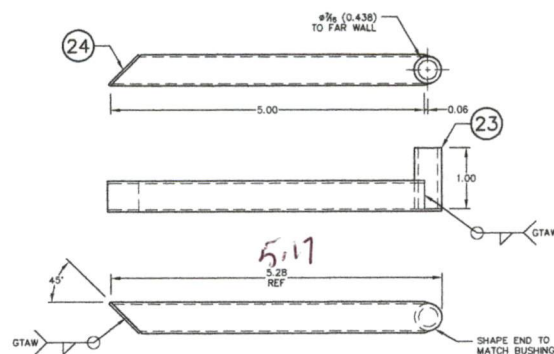
03 CAM



11, 12 DRIVE PLATE ASSEMBLY
LH SHOWN, RH OPPOSITE

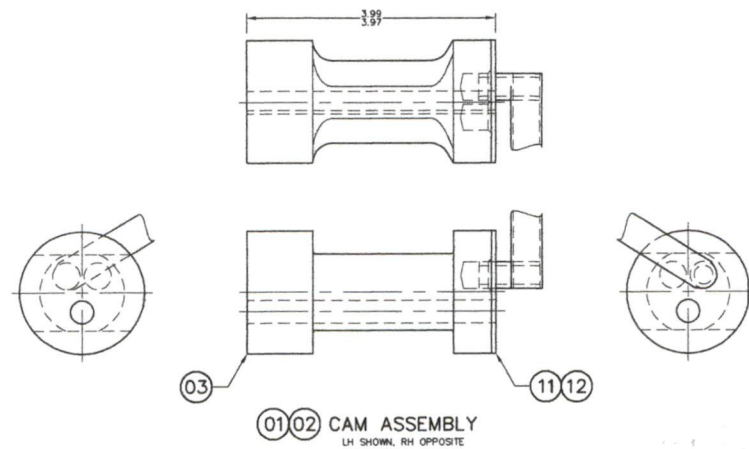


13 DRIVE PLATE




21, 22 HANDLE ASSEMBLY
LH SHOWN, RH OPPOSITE

- NOTES
1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
 2. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.



01, 02 CAM ASSEMBLY
LH SHOWN, RH OPPOSITE

QTY	QTY	QTY	QTY	QTY	QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
1	1					100222-24	24	CAP	304 STAINLESS STEEL	AMS 5513	MIN 0.025 SHEET
1	1					100222-23	23	BUSHING	304 STAINLESS STEEL	ASTM A286	0.438 X 0.065 TUBE
		1				100222-22	22	RH HANDLE ASSEMBLY	304 STAINLESS STEEL	ASTM A554	0.5 X 0.035 SQR TUBE
			1			100222-21	21	LH HANDLE ASSEMBLY	304 STAINLESS STEEL	ASTM A554	0.5 X 0.035 SQR TUBE
				1		100222-13	13	DRIVE PLATE	304 STAINLESS STEEL	AMS 5513	0.072 SHEET
				1		100222-12	12	RH DRIVE PLATE ASSEMBLY			
					1	100222-11	11	LH DRIVE PLATE ASSEMBLY			
					1	100222-03	03	CAM	BLACK ACETAL	ASTM D6778	2.0 ROD
						100222-02	02	RH CAM ASSEMBLY			
						100222-01	01	LH CAM ASSEMBLY			

APPROVALS		DATE	AERO DESIGN LTD.	
DRAWN:	JEFF CLARKE	04 SEPT 2015	 8888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.481.5291 www.aerodesign.ca	
CHECKED:	JASON REKIVE	04 SEPT 2015		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:			AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION CAM FABRICATION	
DECIMALS	ANGLES		SCALE 1 : 1	REV.
X.XXX ±0.010	±1/2°			
X.XX ±0.03				
X.X ±0.1				
SHEET 1 OF 1			A1	100222 0

61.6 lb
as weighed
rack.

FLIGHT TEST PLAN

FTP1002.03

AIRBUS HELICOPTERS AS350 & AS355

QUICK RELEASE BICYCLE RACK

Prepared by: J. Clarke, P.Tech.(Eng.)

Revision 0, 20 May 2016

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

Phone: 604-483-2376

Fax: 604-483-2372

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1.0 INTRODUCTION

The Quick Release Bicycle Rack is mounted on the right and/or left side of the helicopter. The bike rack is made of aluminum extruded rails with stainless steel tubing frames to support the bikes. It is quickly detachable from the mounting beams that support it.

Each bike is secured with a fixed frame and a moveable frame to allow for adjustment. The moveable frame is secured with a positive locking cam action.

2.0 REFERENCE TEXT

Aero Design Ltd. Installation Drawings

100201, Revision 0 – Quick Release Bicycle Rack Installation

78602, Revision 1 – Quick Release Mounting Provisions Installation

78603, Revision 1 – Quick Release Mounting Provisions Installation (Cargo Pod Compatible)

94001, Revision 1 – Quick Release Cargo Basket Installation

Aero Design Ltd. Flight Manual Supplement FMS1002.91 Revision 0 (draft)

Airbus Helicopters AS350 Rotorcraft Flight Manual (as applicable to model used test)

3.0 FLIGHT TEST OBJECTIVE

Flight testing of the Quick Release Bicycle Racks is meant to demonstrate the following:

- the installation is free of excessive vibration at speeds from hover thru to V_d ;
- the installation does not produce undesirable effects to the handling and performance qualities of the helicopter;
- to determine the critical loading conditions with respect to vibration for comprehensive flight testing.

This flight testing is in advance of comprehensive flight testing by a Transport Canada Flight Test Delegate in support of obtaining a Supplemental Type Certificate.

4.0 TEST PREPARATION

4.1 Instrument Calibration

The maintenance records of the test helicopter will be checked to ensure the airspeed indicator has been calibrated within the specified time period.

4.2 Equipment

1. The helicopter will be fitted with the Quick Release Mounting Provisions Installation in accordance with drawing 78602 and/or 78603 for the configurations specified in section 4.5.

2. The helicopter will be fitted with the Quick Release Bicycle Rack Installation in accordance with drawing 100201 for the configurations specified in section 4.5.
3. The helicopter will be fitted with the Quick Release Cargo Basket Installation in accordance with drawing 94001 for the configurations specified in section 4.5.
4. The helicopter will be fitted with Vibrex VXP vibration monitoring equipment with velometers in the following locations:
 - A) Cabin floor *vertical orientation*
 - B) Horizontal tail *horizontal orientation*
 - C) Vertical tail *vertical orientation*
 - D) Bike rack *vertical orientation*

4.3 Flight Test Crew

Two crew members will be required for the test:

- 1) Pilot with training and experience appropriate to the task of testing this equipment.
- 2) Test observer, Jeff Clarke and/or Jason Rekve, representing the applicant.

All members of the crew will be equipped to communicate via intercom.

Seating arrangement of the observer(s) may be limited by loading requirements.

4.4 Documents

Attach copies of the following documents to the completed report.

- ✓ • Flight Authority, Flight Test Permit issued by Transport Canada. Flight permit must allow flight to 1.11 Vne.
- ✓ • Current Weight and Balance report showing test configurations.
- ✓ • Conformity Inspection Record AN B043, signed by qualified AME.
- ✓ • Statement of Suitability for Flight Test, SI 521-004, Table F-1
- ✓ • Flight Test Safety Check List, SI 521-004, Table F-2
- ✓ • Confirmation of insurance with aircraft in test configuration
- ✓ • The draft Flight Manual Supplement, FMS1002.91 Revision 0, shall be on board the aircraft.

The Pilot will familiarize himself with the contents of this Test Plan and the Flight Manual Supplement prior to flight.

4.5 Configuration

The helicopter will be loaded with sufficient fuel and ballast to produce the following conditions for flight:

- A) Helicopter un-modified*, with weight and balance within limits specified in the flight manual.
- B) Bicycle Rack configuration 100201-XX-02** installed (right side), no bikes.
- C) Bicycle Rack configuration 100201-XX-02** installed (right side), with one bike:
 - i. Inboard position

- ii. Center position
 - iii. outboard position
- D) Bicycle Rack configuration 100201-XX-02** installed (right side), with two bikes:
 - i. Inboard and center positions
 - ii. Center and outboard positions
 - iii. Inboard and outboard positions
- E) Bicycle Rack configuration 100201-XX-02** installed (right side), 3 bikes loaded
- F) Bicycle Rack configuration 100201-XX-01** installed (left side), no bikes
- G) Bicycle Rack configuration 100201-XX-01** installed (left side), with one bike:
 - i. Inboard position
 - ii. Center position
 - iii. outboard position
- H) Bicycle Rack configuration 100201-XX-01** installed (left side), with two bikes:
 - i. Inboard and center positions
 - ii. Center and outboard positions
 - iii. Inboard and outboard positions
- I) Bicycle Rack configuration 100201-XX-01** installed (left side), 3 bikes loaded;
- J) Bicycle Rack configuration 100201-XX-01** and 100201-XX-02** installed (both sides), no bikes.
- K) Bicycle Rack configuration 100201-XX-01** and 100201-XX-02** installed (both sides), both racks loaded with bike(s) in most critical position(s) determined in C), D) or E) (right side) and G), H) or I) (left side).
- L) Bicycle Rack configuration 100201-XX-02** installed (right side), no bikes; and 94001-XX-02** Basket installed (left side).
- M) Bicycle Rack configuration 100201-XX-02** installed (right side), bike(s) in most critical position(s) determined in C), D) or E) above; and 94001-XX-02** Basket installed (left side).
- N) Bicycle Rack configuration 100201-XX-01** installed (left side), no bikes; and 94001-XX-02** Basket installed (right side).
- O) Bicycle Rack configuration 100201-XX-01** installed (left side), bike(s) in most critical position determined in G), H) or I) above; and 94001-XX-01** Basket installed (right side).

*Note: The External Attachment Provisions Installation (78602 and/or 78603) may be installed for the unmodified flight.

**Note: -XX- part number to be determined by the mounting provisions configuration required on installation. Refer to drawing 100201 and 94001 for configuration part numbers

C of G must remain within the limits specified in the Flight Manual. Similar longitudinal C of G and weight to be maintained for each flight as practical.

Loading information specific to the Quick Release Bicycle Rack is contained in the Flight Manual Supplement, FMS1002.91. The bike racks will be loaded with mountain/downhill type bikes, with 26"-29" wheels, which fit and can be properly secured by the bike rack locking frame.

5.0 FLIGHT TESTS

5.1 Vibration and Handling Flights

One flight is required for each of the configurations listed in 4.5 above.

The flights are to be conducted as follows:

Take off and establish cruise at 50 kts. Increase speed in 10 kt increments up to Vne. Gently maneuver the aircraft at each speed. Recover from Vne, then accelerate to Vd ($1.11 \times Vne$). Do not maneuver the aircraft until recovered from Vd.

Vne as follows, refer to the Flight Manual:

Airbus Helicopters AS350 B2. AS350 B3

Configuration A, B, F, J, L, N – unmodified or no bikes mounted on rack

Vne = 155 KIAS at sea level, reduce by 3 knots per 1000 feet.

Vd = $1.11 \times Vne$ = 172 KIAS at sea level, reduce with altitude per Vne reduction

All other configurations – bike(s) mounted on the bike rack

Vne = 110 KIAS unless the existing flight manual or applicable supplements are more restrictive

Vd = $1.11 \times Vne$ = 122 KIAS

If maximum Vne/Vd shown above is not achieved, record maximum speed. Note limiting condition(s) in observations.

Record that each airspeed shows acceptable vibration and handling qualities by putting a check in each box in section 6.0. Record any observations. Indicate critical conditions determined from vibration analysis by comparing to un-modified condition.

5.2 Other Flights

Flight testing performed by a Transport Canada Flight Test Delegate may deviate from this test plan at the discretion of the test pilot in order to complete a comprehensive flight test report.

6.0 RECORDING OF RESULTS

Model: Airbus Helicopters AS350 B3Serial Number: 4808Registration: C-FDGA

Gross Weight: _____ lb

Results:

Configuration	Airspeed (KIAS)											Vne (155)	Vd (172)
	50	60	70	80	90	100	110	120	130	140			
A) Un-modified	✓	✓	✓	✓	✓	✓	✓	✓		V _{ne} ✓		✓	✓
100201-03 01-02 Bike Rack (RH) V _h 115-120 → Flt #10													
B) Empty	✓	✓	✓	✓	✓	✓	✓	✓					✓
V _h = 115													
C) Single bike													
i) inboard		✓		✓		✓	V _h 105 ✓						
ii) center		✓		✓		✓	V _h 105 ✓						
iii) outboard		✓		✓		✓	V _h 108 ✓						
D) 2 bikes													
i) inboard and center		✓		✓		✓	V _h 105 ✓						
ii) center and outboard		✓		✓		✓	V _h 108 ✓						
iii) inboard and outboard		✓		✓		✓	V _h 103 ✓						
E) 3 Bikes		✓		✓		✓	V _h 104 ✓						

01 JUNE 2016

Penbarrow Area 11:40 start

OAT 22.5° 1750 ft 50/60/70

2000 ft go on / first flt

1st tower didn't record

2000 ft second flt end 1:10

straight flt + level

2:15 #3 24.76 6E 5:10

6D 5:35 9:25/JUNE 2 6E

7B 10:35 17.6° 4/5

7A 10:45 5/6

7D 11:10/16 18.3°

7C 10:50

	Airspeed (KIAS)											
Configuration	50	60	70	80	90	100	110	120	130	140	Vne (155)	Vd (172)
03 100201-XX-01 Bike Rack (LH)												
F) Empty		✓		✓		✓		✓				
Vh 115												
G) Single Bike												
i) inboard		✓		✓		✓	Vh 105 ✓					
ii) center		✓		✓		✓	Vh 105 ✓					
iii) outboard		✓		✓		✓	Vh 105 ✓					
H) 2 bikes												
i) inboard and center		✓		✓		✓	Vh 105 ✓					
ii) center and outboard		✓		✓		✓	Vh 105 ✓					
iii) inboard and outboard		✓		✓		✓	Vh 105 ✓					
I) 3 Bikes		✓		✓		✓	Vh 105 ✓					
03 100201-XX-01 Bike Rack (LH) and 100201-XX-02 Bike Rack (RH)												
J) Empty		✓		✓		✓	Vh 105 ✓					
K) Critical bike location(s)		✓		✓		Vh 95 ✓	Vh 105 ✓	Vd 122 ✓				
all 3 both sides												
03 100201-XX-02 Bike Rack (RH) 94001-XX-02 Basket (LH)												
L) Empty		✓					Vh 110 ✓			Vne 140 ✓		
M) Critical bike location(s)		✓					Vh 110 ✓					
3 bikes												
03 100201-XX-01 Bike Rack (LH) 94001-XX-01 Basket (RH)												
N) Empty		✓				Vh 95 ✓	Vh 105 ✓			Vne 140 ✓		
O) Critical bike location(s)		✓				Vh 95 ✓		✓				

Notes/Observations:

External modifications: (e.g. bearpaws, mirror)

BEARPAWS, CARGO SWINGS, RH STEP, MIRROR,
WIRE STRIKE, VXP SENSORS, ATTACH MOUNTS LH/RH
VXP RECORDED/NOTED SEPARATE RH checked

Hover - Clean ✓, ^{empty} RH ✓, ^{empty} LH ✓, ^{empty} 2x ✓, LH OB ✓, LH MID ✓, LH IB ✓, RH OB ✓, RH MID ✓
RH IB ✓, RH OB/CEN ✓, IB/CEN ✓, IB/OR ✓, ~~3~~ ✓, LH OB/CEN ✓, IB/CEN ✓, IB/OB ✓, 3 ✓, All 6 ✓

Dual rack empty maneuvering good

LH OB climb to 60 KIAS good, maneuvering good

LH MID 80 KIAS LH Turn good, RH turn 90 KIAS good

RH OB 80 KIAS → 50 KIAS Slip and turn good

Long time to reach Vd → descend @ 4000 ft/min, not nosed over into
full dive
Smother, no vibe in bikes

2:30 FLT #10 - 12000 ^{1 to 150} V_h clean for reference

Flight test performed by:

Date:

Amy MEELER *Can CHANGED.*

JUNE 2/2016

Table F-2
Example of Flight Test Safety Checklist

Aircraft	AS380 B3
Test Purpose	BIKE RACKS
Flight Crew	
Flight Date	01 JUNE 2016

Ref.	Checklist Item	N/A	Yes	No
1.	Crew Considerations			
1.1	Are all crewmembers fit to fly and sufficiently rested?		✓	
1.2	Is the crew familiar with operating the aircraft and its test equipment?		✓	
1.3	Have all crewmembers had sufficient time to consider the content of the test plan and understand the purpose of the tests?		✓	
1.4	Are all crewmembers confident in their ability to carry out the tests required, safely and efficiently?		✓	
1.5	Have all ground crewmembers been briefed adequately?		✓	
2	Test Planning			
2.1	Has a draft AFM or equivalent information covering operation of the aircraft been reviewed?		✓	
2.2	Are exceedances of any AFM limitations permitted and agreed to?		✓	
2.3	Are any additional flight limitations specified and agreed to?	✓		
2.4	Have any specific or unusual limitations been discussed and understood?	✓		
2.5	Has the written flight test plan been agreed to?		✓	
2.6	Is the flight permit valid for the proposed flight tests?		✓	
3	Equipment			
3.1	Are adequate communication systems available to all crewmembers?		✓	
3.2	Has all required safety equipment been installed and tested as necessary?		✓	
3.3	Is survivability equipment adequate for the flight taking into account the testing environment (e.g. over water, winter)?		✓	
3.4	Have the Flight Data Recorder and Cockpit Voice Recorder been tested as necessary?	✓		
4	Configuration			
4.1	Has a conformity inspection been performed?		✓	
4.2	Is the aircraft, without the test modifications, in the approved configuration?		✓	
4.3	Do aircraft test modifications correlate with required configuration?		✓	
4.4	Has disposition of all snags since last flight(s) been reviewed?		✓	
4.5	Has significant maintenance action since last flight been reviewed?		✓	
4.6	Has all required maintenance been accomplished?		✓	
4.7	Is aircraft weight and balance report valid and current for the test configuration?		✓	
4.8	Is aircraft correctly loaded in accordance with the weight and balance report?		✓	
4.9	Is flight test ballast adequately secured?	✓		
5	Safety Planning			
5.1	Has the Flight Test Safety Assessment been reviewed?		✓	
5.2	Has the flight test plan been briefed?		✓	
5.3	Have all required ground tests been completed?	✓		

Changes to the Type Design of an Aeronautical Product

		N/A	YES	NO
5.4	Have previous tests results been reviewed?	✓		
5.5	Have anticipated results (including failures of the system under test) been reviewed?		✓	
5.6	Have any special test procedures been reviewed (covered in checklists if necessary)?	✓		
5.7	Have build-up techniques been developed?		✓	
5.8	Have criteria for discontinuing the test or flight been agreed to?		✓	
5.9	Have all safety/recovery procedures been briefed?		✓	
5.10	Have escape drills been adequately briefed?	✓		
5.11	If devices/interlocks are to be disabled during the flight (e.g. circuit breakers, warning horn, power lever baulk), have procedures been put in place to re-enable the devices following test?	✓		
5.12	Have all safety procedures for formation flight (e.g. chase aircraft), been briefed?	✓		
5.13	Has Crash Fire Rescue been informed and briefed?	✓		
6	Miscellaneous			
6.1	Have weather minimums been agreed to?		✓	
6.2	Have atmospheric conditions for the tests been agreed?		✓	
6.3	Have time of day limitations (e.g. sufficient daylight for rescue operations) been agreed to?		✓	
6.4	Is usable fuel commensurate with expected fuel usage during test flight and adequate reserves?		✓	
6.5	Are takeoff and landing runway(s) suitable?		✓	
6.6	Is the test area suitable?		✓	
6.7	Does applicant have insurance coverage in place?		✓	
6.8	Has a copy of the flight permit, a copy of the flight test plan and the estimated time of arrival for the flight been left on the ground with a responsible third party?		✓	
7	Other			
	Completed By: JEFF CLARKE			
	Date: 21 JUNE 2016			



CERTIFICATE OF INSURANCE
Policy No. AV 025461314-02

Certificate Holder(s):
To Whom It May Concern

THIS IS TO CERTIFY that Insurance as described hereunder has been arranged on behalf of the Named Insured noted herein and that such Insurance, as of the date hereof, is in full force and effect:

Named Insured: Blackcomb Aviation Limited Partnership by its general partner Blackcomb Aviation Ltd. a/o
Blackcomb Helicopters Limited Partnership by its general partner Blackcomb Helicopters Ltd. a/o
Omega Air Corporation c/o/b Blackcomb Aviation

Policy Period: From: July 1, 2015 To: July 1, 2016
(both dates at 00:01 a.m. Local Standard Time at the address of the Named Insured)

Aircraft Insured: All Rotary Wing Aircraft Owned, Operated and/or Leased by the Named Insured

Coverage: (A) Hull "All Risks" Rotors In Motion / Rotors Not In Motion
(B) Aircraft Legal Liability in respect of Third Party Bodily Injury and/or Property Damage
(inclusive of Passenger, Baggage and Cargo Liability)

Sum Insured / Limit(s) of Liability: (A) As agreed with the Named Insured
(B) CAD30,000,000 Combined Single Limit, each Occurrence

Conditions: As per policy issued by or on behalf of the Subscribing Insurer(s) as referenced herein.

Subscribing Insurer(s): Certain Canadian Licensed Insurers as effected through BMG Insurance Brokers

The Insurance described above is subject to the limitations, exclusions, terms and conditions contained in the policy(ies). By issuance of this Certificate BMG Insurance Brokers accepts no responsibility to maintain the coverage stated or advise of the termination of any policy(ies).

Date:
July 1, 2015

This Certificate cancels and
supersedes all previously issued
Certificates

On behalf of:
BMG Insurance Brokers

Authorized Representative

**** SEVERAL LIABILITY NOTICE ****

The subscribing Insurers' obligations under contracts of insurance to which they subscribe are several and not joint and are limited solely to the extent of their individual subscriptions. The subscribing Insurers are not responsible for the subscription of any co-subscribing Insurer who for any reason does not satisfy all or part of its obligation.

4360 Agar Drive, Richmond, British Columbia, V7B 1A3
Phone: 604-276-2428 / Fax: 604-276-2445
www.bmginsurance.com

cc: Named Insured
Certificate No. HL-1



Transport Canada Transports Canada

FLIGHT AUTHORITY

AUTORITÉ DE VOL

To - À: Blackcomb Helicopters Ltd, PO Box 1241, Whistler, BC, V0N 1B0

Nationality and Registration Marks Marques de nationalité et d'immatriculation	Aircraft Manufacturer and Model Constructeur et modèle de l'aéronef	Aircraft Serial Number Numéro de série de l'aéronef
C-FDGA	EUROCOPTER AS350B3	4808

<input type="checkbox"/> CERTIFICATE OF AIRWORTHINESS In respect of the noise emission standards this aircraft: En vertu des normes d'émission de bruit, l'aéronef mentionné:	<input type="checkbox"/> CERTIFICAT DE NAVIGABILITÉ <input type="checkbox"/> is not required to comply with requirements n'est pas obligé de satisfaire aux exigences <input type="checkbox"/> complies with the requirements specified below satisfait aux exigences précisées ci-dessous
---	--

<input type="checkbox"/> SPECIAL CERTIFICATE OF AIRWORTHINESS Provisional - Provisoire Restricted - Restreint	<input type="checkbox"/> CERTIFICAT SPÉCIAL DE NAVIGABILITÉ Amateur-Built - Construction amateur Limited - Limité	<input type="checkbox"/> Owner Maintenance - Maintenance par le propriétaire
This document is subject to the following operating conditions of issue: Le présent document est assujéti aux conditions d'exploitation suivantes :		Indicate Numbers: Inscrire les numéros :
The aircraft may only be operated from: L'aéronef ne peut être exploité qu'à partir de :		Gross take-off weight not to exceed: Ne pas excéder la masse maximale brute au décollage : lb kg <input type="checkbox"/> As per Flight Manual - Selon le manuel de vol

<input checked="" type="checkbox"/> Flight Permit - Specific Purpose Permis de vol - Fin Spécifique	<input type="checkbox"/> Flight Permit - Experimental Permis de vol - Expérimental
<input type="checkbox"/> Ferry Flight Vol de convoyage	<input type="checkbox"/> Demonstration, market survey or crew training Vol de démonstration, étude de marché ou formation d'équipage
<input type="checkbox"/> Importation or exportation flight Vol pour fin d'importation ou d'exportation	
<input checked="" type="checkbox"/> Other temporary purposes (Specify) Pour d'autres fins temporaires (Préciser)	Test of Aero Design Bicycle Rack Per FTP1002.03

Flight from - Vol de	To - A	To - A
Pemberton BC, CYPS	Pemberton BC, CYPS	N/A
This document is subject to the following operating conditions of issue:	Le présent document est assujéti aux conditions d'exploitation suivantes :	Indicate Numbers: Inscrire les numéros : 3, 9, 12, 21, 29, 31 and 32
The aircraft may only be operated from: L'aéronef ne peut être exploité qu'à partir de :	Gross take-off weight not to exceed: Ne pas excéder la masse maximale brute au décollage : lb kg <input checked="" type="checkbox"/> As per Flight Manual - Selon le manuel de vol	
This document is valid for the number of days indicated on the right, following the date of issue. Where pertinent, a replacement flight authority will be issued to you.		Days - Jours 30

For the Minister of Transport - Pour le ministre des Transports	Date of Issue - Date de délivrance (yyyy-mm-dd / aaaa-mm-jj)	Region - Région
Shawn A Johnson	2016-05-31	Pacific

Fee paid - Montant versé \$	<input type="checkbox"/> Cash Comptant	<input type="checkbox"/> Cheque Chèque	Receipt No. N° du reçu 2030892
-----------------------------	---	---	-----------------------------------

Operating Conditions

1. Valid for the purpose of (specify purpose);
2. Use as a commercial aircraft prohibited;
3. Crew members only, no passengers;
4. Crew members only - no passengers, except those persons whom the pilot-in-command determines as having a bona fide interest in the demonstration;
5. Crew members shall be the holders of valid and subsisting pilot licences issued or endorsed by Canada or the (state of registry to be specified) and which are appropriate to their duties;
6. Gross take-off weight not to exceed (specific weight to be listed on the flight permit);
7. Flight into known or predicted icing conditions prohibited;
8. VNE to be established by flight test;
9. Day VFR only;
10. VFR only;
11. Flight over built-up areas prohibited;
12. Flight over built-up areas prohibited, and flight in congested airspace to be avoided;
13. Flight over built-up areas prohibited except during take-offs and landings;
14. Flight authority issued by (specify authority) shall be valid and shall be carried on board the aircraft together with this validation;
15. Controlling Air Traffic Control unit to be informed of the experimental nature of the aircraft and the evaluation program prior to flight;
16. The aircraft shall be formally or provisionally registered in (specify state);
17. Compliance required with the conditions on the (specify type of permit and authority);
18. Controlling Agency at airport of take-off shall be informed of overload conditions prior to take-off;
19. Permission of the foreign aviation authority required prior to flight in their airspace;
20. The aircraft can only operate from a base indicated by Transport Canada in order to provide the highest degree of safety for the operation of the aircraft;
21. The aircraft shall not be operated (flown) more than 25 nautical miles from the base mentioned in (20) except with written authority of the Regional Director Aviation Licensing, (specify region) Region, which will be provided, taking into account the safety of the flight;
22. The aircraft shall not be flown over any built-up area, or open air assembly of persons;
23. Carriage of persons other than for dual instruction is prohibited (not to be used for single seat aircraft);
24. Aerobatic flight is prohibited (not to be used for balloons);
25. During the first 5 hours of flight, the aircraft can only be flown by pilots who have acquired not less than 100 hours of pilot-in-command flight time in powered aircraft (not to be used for gliders, gyroplanes, or balloons);
26. Aircraft is to be registered for "Private Purposes" only;
27. Aircraft to be placarded in the cockpit "Restricted - Agricultural Purposes Only";
28. Validity period;
29. Flight testing to be conducted away from built-up areas, airways and air routes;
30. Ferry-flight (specify from) to (specify to) to be via (specify routing) with technical landings as required;
31. The side of the aircraft fuselage is to be placarded, in a place that is readily visible to persons entering the aircraft, in letters at least 3/8 inch in height and of a colour that contrasts sharply with the background on which they are shown, in both official languages, as follows:

NOTICE: THIS AIRCRAFT IS OPERATING WITHOUT A CERTIFICATE OF AIRWORTHINESS.

AVIS : CET AÉRONEF VOLE SANS CERTIFICAT DE NAVIGABILITÉ.

32. The aircraft shall be certified as serviceable for the proposed flight by a qualified Aircraft Maintenance Engineer or such other authorized person in the Aircraft Journey Log book prior to commencement of the flight.

33. The following operating limitation(s) as specified to the Minister shall apply:

*AIRCRAFT RESTRICTED TO OPERATING LIMITS
AS DETAILED IN AERO DESIGN FTR 1002-03
OR THE LIMITS OF THE AIRCRAFT FLIGHT
MANUAL WHICHEVER IS MORE RESTRICTIVE*

Conditions d'exploitation

1. Valide aux fins de (préciser les fins);
2. L'exploitation à titre d'aéronef commercial est interdite;
3. Membres d'équipage seulement - pas de passagers;
4. Membres d'équipage seulement - pas de passagers, sauf les personnes qui de l'avis du commandant de bord ont un intérêt réel dans la démonstration;
5. Les membres d'équipage doivent être titulaires de licences de pilote valides et en vigueur délivrées ou annotées par le Canada ou (préciser l'État d'immatriculation) et correspondant à leurs fonctions.
6. Ne pas excéder la masse maximale brute au décollage (qui doit être indiquée sur le permis de vol);
7. Vol interdit dans des conditions de givrage existantes ou prévues;
8. La VNE doit être établie par essai en vol;
9. VFR de jour seulement;
10. VFR seulement;
11. Le survol des zones bâties est interdit;
12. Le survol des zones bâties est interdit, et le vol dans un espace aérien à forte densité de circulation est à éviter;
13. Le survol des zones bâties est interdit, sauf au décollage et à l'atterrissage;
14. L'autorité de vol délivrée par (préciser l'autorité) doit être en vigueur et se trouver à bord de l'aéronef avec la présente validation;
15. L'unité de contrôle de la circulation aérienne qui exerce le contrôle doit être informée avant le vol de la nature expérimentale de l'aéronef et du programme d'évaluation;
16. L'aéronef doit être officiellement ou provisoirement immatriculé dans (préciser l'État);
17. La conformité avec les conditions figurant sur le (préciser le type de permis et l'autorité) est obligatoire;
18. L'organisme qui exerce le contrôle à l'aéroport de décollage doit être informé avant le décollage des conditions de surcharge;
19. Le vol dans l'espace aérien étranger est interdit, sauf avec l'autorisation préalable de l'autorité de l'aviation civile étrangère en cause;
20. L'aéronef ne peut être exploité qu'à partir de la base précisée par Transports Canada de façon à garantir le degré optimal de sécurité d'exploitation de l'aéronef;
21. L'aéronef ne peut être exploité que dans une zone d'un rayon maximum de 25 NM de la base mentionnée à l'alinéa 20, sauf avec l'autorisation écrite du directeur régional de la navigabilité, région (préciser la région), qui sera fournie compte tenu de la sécurité du vol;
22. Il est interdit de survoler des zones bâties ou des rassemblements en plein air;
23. Il est interdit de transporter des personnes sauf pour l'instruction en double commande (ne pas utiliser dans le cas des aéronefs monoplaces);
24. Le vol d'acrobatie aérienne est interdit (ne pas utiliser dans le cas de ballons);
25. Seul un pilote ayant accumulé au moins 100 heures de vol à titre de commandant de bord d'aéronefs propulsés par un organe moteur est autorisé piloter cet aéronef au cours des cinq premières heures de vol (ne pas utiliser dans le cas des planeurs, des autogires ou des ballons);
26. L'aéronef doit être immatriculé « à des fins privées » seulement;
27. Une affiche « Restreint - fins agricoles seulement » doit être apposée dans le poste de pilotage;
28. Période de validité;
29. Les essais en vol doivent être effectués hors des zones bâties, des voies aériennes et des routes aériennes;
30. Le vol de convoyage doit être effectué de (préciser la partance) à (préciser la destination) via (préciser la route) avec escales techniques au besoin;
31. Une affiche doit être apposée au côté du fuselage de l'aéronef, en un endroit facilement visible pour les personnes qui montent dans l'aéronef, en lettres d'au moins 3/8 pouce de hauteur et d'une couleur contrastant clairement avec le fond sur lequel elles sont apposées, dans les deux langues officielles, portant les mots :

AVIS : CET AÉRONEF VOLE SANS CERTIFICAT DE NAVIGABILITÉ.

NOTICE: THIS AIRCRAFT IS OPERATING WITHOUT A CERTIFICATE OF AIRWORTHINESS.

Table F-1

Statement of Suitability for Flight Test

Aircraft Type/Model: Airbus Helicopters AS350

Registration: C-FDGA

Serial Number: 4808

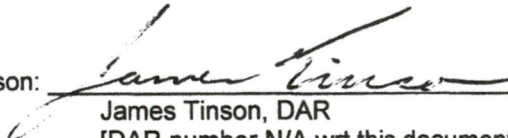
Description of Design Change(s):

Installation of Aero Design Ltd. Quick Release Bicycle Rack in accordance with drawing 100201, Rev. 0, using -02 Attachment Brackets per drawing 100230, Rev. 0, Dated 26 May 2016 on mounting provisions installed in accordance with STC SH08-16, drawing 78602 and/or 78603 as applicable.

Statement of Suitability for Flight Test:

This is to certify that I have reviewed the subject design change and that I have reasonable assurance that compliance could be found with all applicable design requirements, except for those requirements that shall be substantiated by flight testing. I consider the aircraft to be safe for flight.



Authorized Person:


James Tinson, DAR
[DAR number N/A wrt this document.]

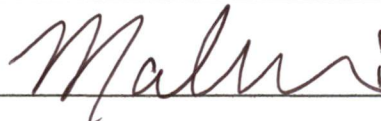
Date: 1 June 2016

(This information can be sent by mail or electronically)

CONFORMITY INSPECTION RECORD


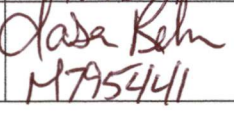
Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Bike Rack Installation Flight Test
	Make	Model	Serial No.	Registration	
	Airbus Helicopters	AS350B3	4808	C-FDGA	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
Installation Drawing 100201, Rev. 0 P/N 100201-03-01 (cheek pod mounted, LH)	 M790747 133.95.34 JUNE 1/2016				
Installation Drawing 100201, Rev. 0 P/N 100201-03-02 (cheek pod mounted, RH)	 M790747 133.95.34 JUNE 1/2016				

<u>APPLICANT'S ATTESTATION</u>	<u>TC INSPECTION</u>
<p>I hereby confirm that the prototype installation for the subject</p> <p><input checked="" type="checkbox"/> MODIFICATION,</p> <p><input type="checkbox"/> REPAIR,</p> <p><input type="checkbox"/> TSO/AP-TC ARTICLE</p> <p>is in conformity with the applicable installation drawing(s) listed above and that necessary ground tests have been carried out. [Please check (✓) the applicable box.]</p>	<p><input type="checkbox"/> ACCEPTABLE</p> <p><input type="checkbox"/> UNACCEPTABLE</p>
<u>Additional Information:</u>	<u>Remarks:</u>

Signature:  M790747
133.95.34

Signature: _____

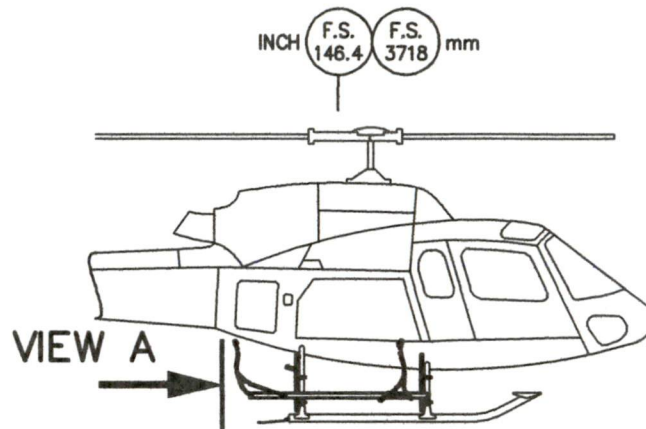
CONFORMITY INSPECTION RECORD

Applicant	Aeronautical Product				Title of Change
Aero Design Ltd.	Make	Model	Serial No.	Registration	Bike Rack Installation Flight Test
	Airbus Helicopters	AS350/AS355	N/A	N/A	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
Assembly Drawing 100210, Rev. 0 P/N 100210-01-01 (LH Assembly)		31 May 16			See additional information below.
Assembly Drawing 100210, Rev. 0 P/N 100210-01-02 (RH Assembly)		31 May 16			See additional information below.

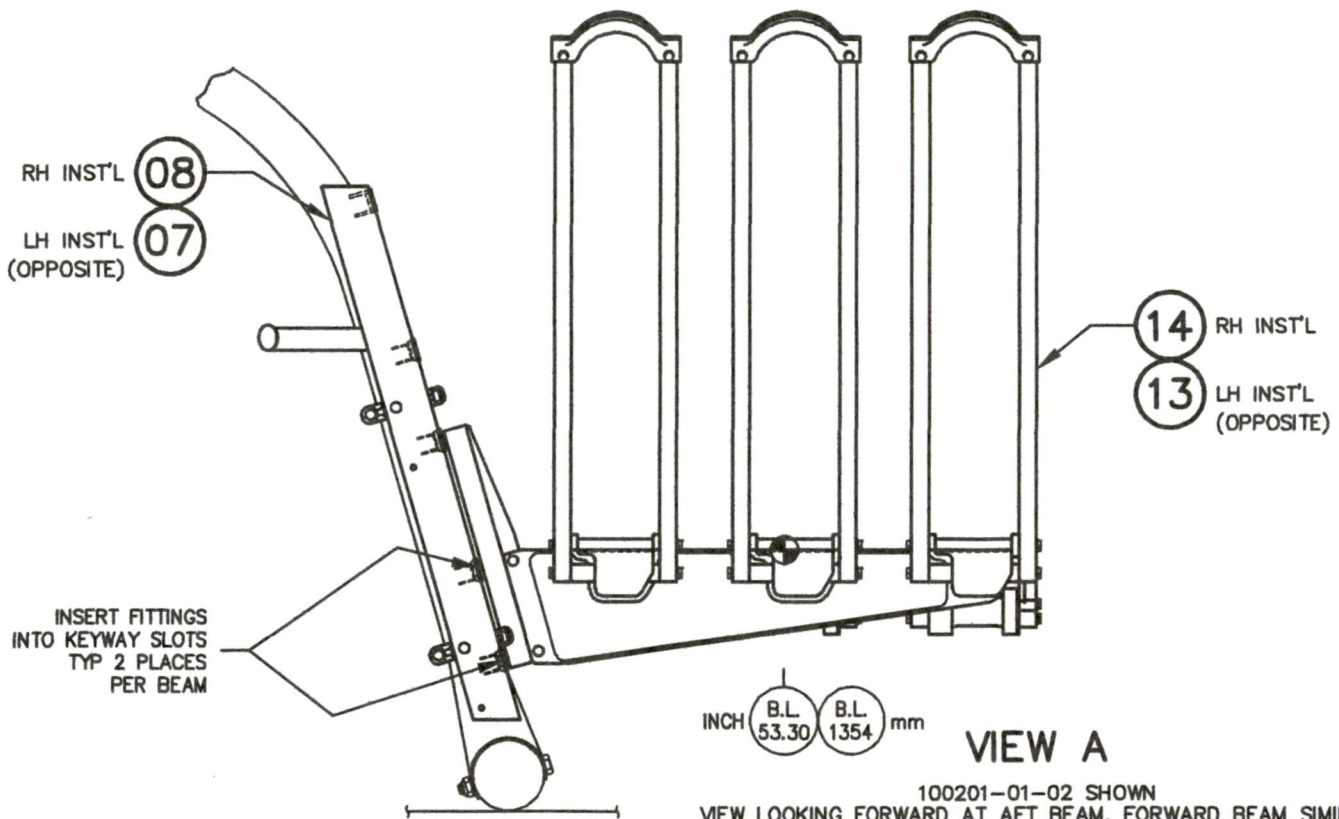
<u>APPLICANT'S ATTESTATION</u>	<u>TC INSPECTION</u>
<p>I hereby confirm that the prototype installation for the subject</p> <p><input checked="" type="checkbox"/> MODIFICATION,</p> <p><input type="checkbox"/> REPAIR,</p> <p><input type="checkbox"/> TSO/AP-TC ARTICLE</p> <p>is in conformity with the applicable installation drawing(s) listed above and that necessary ground tests have been carried out. <i>[Please check (✓) the applicable box.]</i></p>	<p><input type="checkbox"/> ACCEPTABLE</p> <p><input type="checkbox"/> UNACCEPTABLE</p>
<p><u>Additional Information:</u></p> <p>The following discrepancies are noted, but do not affect the results of the flight test and the applicable changes will be incorporated into the final drawings.</p> <p>1) Dwg. 100215 – 100227-01 and -02 Placards are not installed.</p> <p>2) NAS1149F0463P washers used in place of NAS1149F0432P washers to maintain 2-4 threads beyond locking.</p> <p>2) Surface finish is not applied to 100230-02 Attachment Bracket.</p>	<p><u>Remarks:</u></p>

Signature:  _____

Signature: _____



- (02) BICYCLE RACK INSTALLATION – LOW RH
 SHOWN
 (01) BICYCLE RACK INSTALLATION – LOW LH
 OPPOSITE



100201-01-02 SHOWN
 VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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APPROVALS	DATE
DRAWN: JEFF CLARKE	09 SEPT 2015
CHECKED: JASON REKVE	09 SEPT 2015
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1	

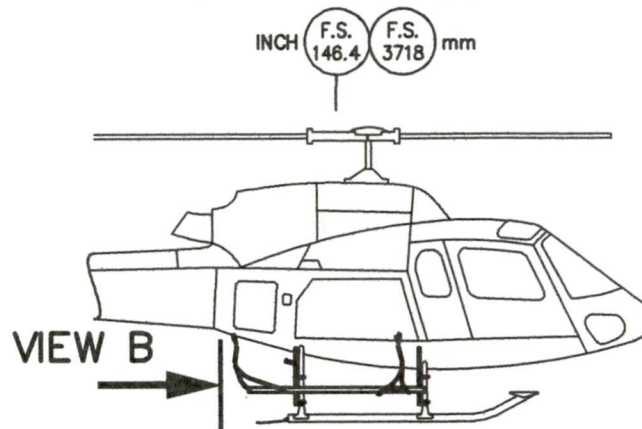


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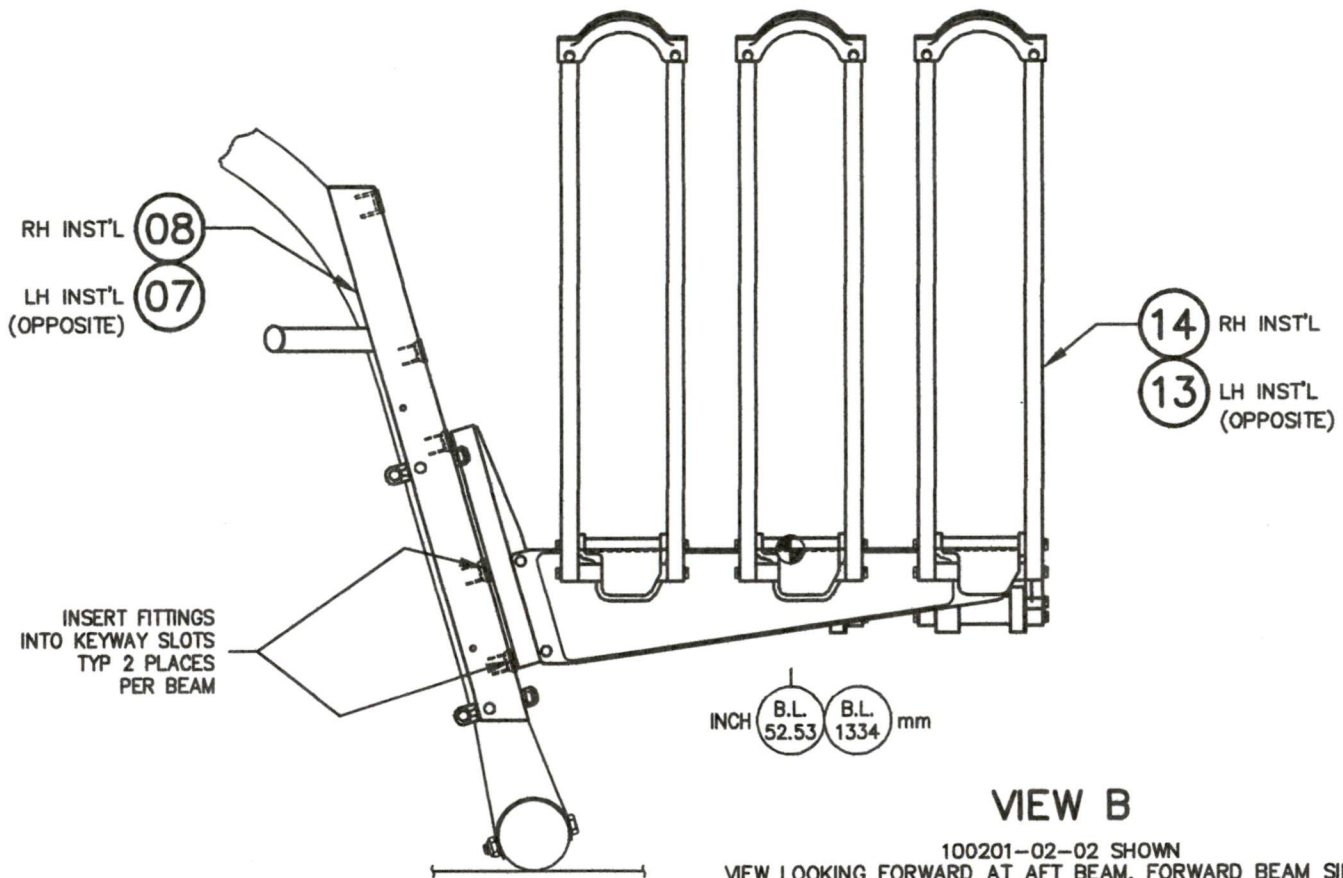
9888A MALASPINA ROAD
 POWELL RIVER, BC, CANADA, V8A 0G3
 TEL: 804.483.2376 www.aerodesign.ca

AIRBUS HELICOPTERS AS350 & AS355 SERIES
 QUICK RELEASE BICYCLE RACK
 BICYCLE RACK INSTALLATION (LOW)

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 4	A4	100201	0



- (04) BICYCLE RACK INSTALLATION – HIGH RH
SHOWN
(03) BICYCLE RACK INSTALLATION – HIGH LH
OPPOSITE



VIEW B

100201-02-02 SHOWN
VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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APPROVALS	DATE
DRAWN: JEFF CLARKE	09 SEPT 2015
CHECKED: JASON REKVE	09 SEPT 2015
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:	
DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

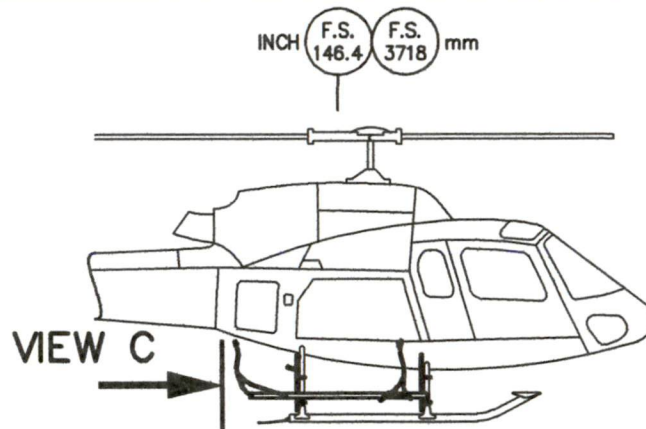


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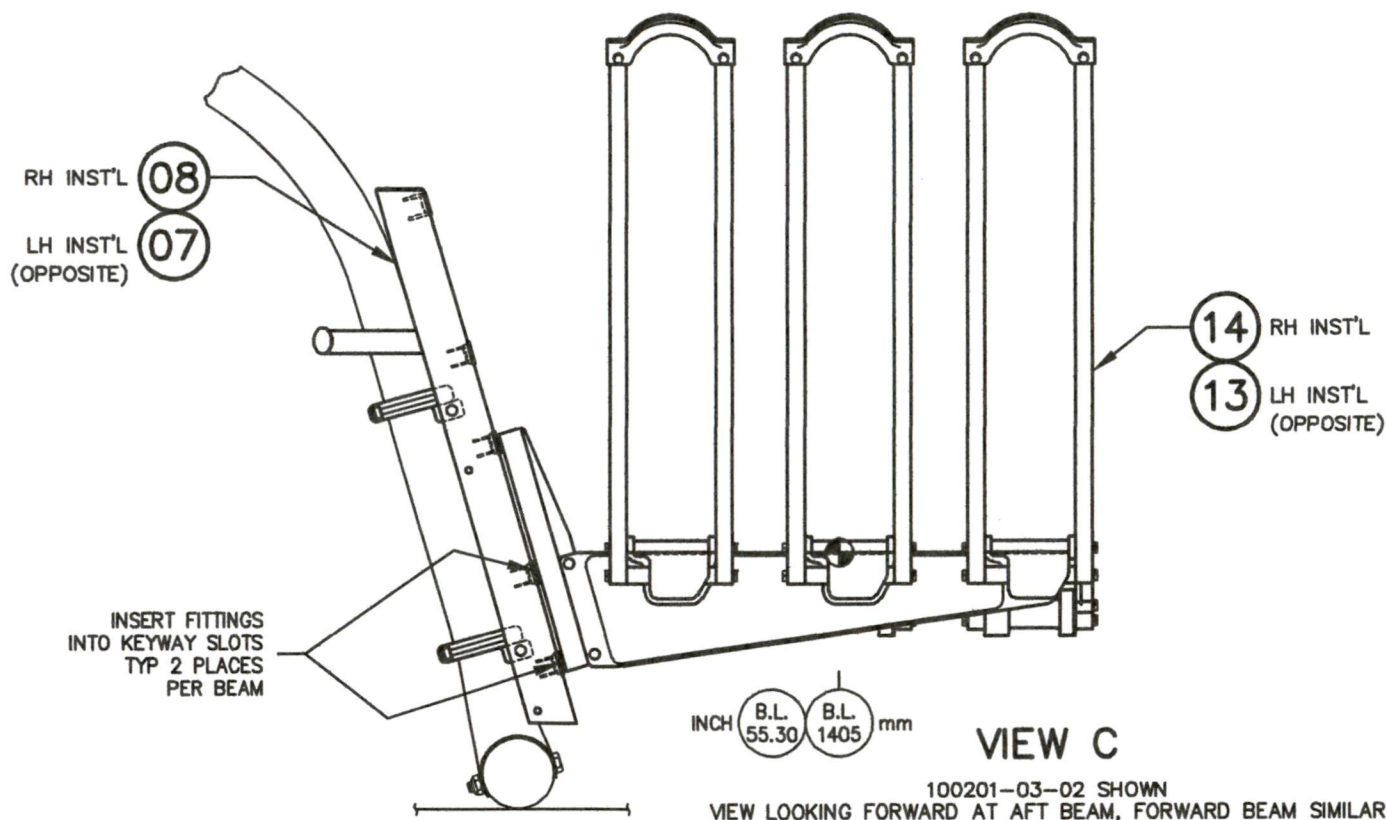
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POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 804.483.2376 www.aerodesign.ca

AIRBUS HELICOPTERS AS350 & AS355 SERIES
QUICK RELEASE BICYCLE RACK
BICYCLE RACK INSTALLATION (HIGH)

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 2 OF 4	A4	100201	0



- 06 BICYCLE RACK INSTALLATION – CARGO POD COMPATIBLE RH
 SHOWN
 05 BICYCLE RACK INSTALLATION – CARGO POD COMPATIBLE LH
 OPPOSITE



100201-03-02 SHOWN
 VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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APPROVALS	DATE
DRAWN: JEFF CLARKE	09 SEPT 2015
CHECKED: JASON REKVE	09 SEPT 2015



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 POWELL RIVER, BC, CANADA, V8A 0G3
 TEL: 604.483.2376 www.aerodesign.ca

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES.
 TOLERANCES ON:
 DECIMALS ANGLES
 X.XXX ±0.010 ±1/2°
 X.XX ±0.03
 X.X ±0.1

AIRBUS HELICOPTERS AS350 & AS355 SERIES
 QUICK RELEASE BICYCLE RACK
 BICYCLE RACK INSTALLATION (POD COMPATIBLE)


NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	
SHEET 3 OF 4	A4	100201	0	

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES:

1. ATTACHMENT PROVISIONS INSTALLED IN ACCORDANCE WITH DRAWING 78602 (STANDARD CONFIGURATION) OR 78603 (CARGO POD COMPATIBLE CONFIGURATION) IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION.
2. SEE FLIGHT MANUAL SUPPLEMENT, FMS1002.91, FOR LIMITATIONS ON HELICOPTER OPERATIONS WITH BICYCLE RACK INSTALLED.
3. SEE INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA1002.90, FOR MAINTENANCE AND WEIGHT AND BALANCE INFORMATION.
4. BICYCLE RACK INSTALLATION IN HIGH AND LOW POSITIONS MAY NOT PROVIDE SUFFICIENT CLEARANCE OF BICYCLE HANDLE BARS FROM SIDE CARGO COMPARTMENT EXTENDERS (COMMONLY REFERRED TO AS SQUIRREL CHEEKS OR CARGO PODS). ROTATION OF HANDLE BARS MAY BE REQUIRED.

1		1		1		100211-01-02	14	RH BICYCLE RACK ASSEMBLY
	1		1		1	100211-01-01	13	LH BICYCLE RACK ASSEMBLY
1						78603-01-01	12	ATTACHMENT PROVISIONS INSTALLATION (CARGO POD COMPATIBLE - RH)
	1					78603-01-02	11	ATTACHMENT PROVISIONS INSTALLATION (CARGO POD COMPATIBLE - LH)
		1				78602-02-01	10	ATTACHMENT PROVISIONS INSTALLATION (HIGH - RH)
			1			78602-02-02	09	ATTACHMENT PROVISIONS INSTALLATION (HIGH - LH)
				1		78602-01-01	08	ATTACHMENT PROVISIONS INSTALLATION (LOW - RH)
					1	78602-01-02	07	ATTACHMENT PROVISIONS INSTALLATION (LOW - LH)
/						100201-03-02	06	BICYCLE RACK INSTALLATION (CARGO POD COMPATIBLE - RH)
						100201-03-01	05	BICYCLE RACK INSTALLATION (CARGO POD COMPATIBLE - LH)
						100201-02-02	04	BICYCLE RACK INSTALLATION (HIGH - RH)
						100201-02-01	03	BICYCLE RACK INSTALLATION (HIGH - LH)
						100201-01-02	02	BICYCLE RACK INSTALLATION (LOW - RH)
						100201-01-01	01	BICYCLE RACK INSTALLATION (LOW - LH)
06	05	04	03	02	01	PART NO.	ITEM	DESCRIPTION
QTY	QTY	QTY	QTY	QTY	QTY	LIST OF MATERIALS		

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	DRAWN: JEFF CLARKE		09 SEPT 2015							
	CHECKED: JASON REKVE		09 SEPT 2015							
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1					AIRBUS HELICOPTERS AS350 & AS355 SERIES QUICK RELEASE BICYCLE RACK BICYCLE RACK INSTALLATION				
						NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.
					SHEET 4 OF 4		A4	100201	0	

DGA FLIGHT TEST

ACCEL: #1 CABIN FLOOR
 #2 LH BIKE RACK
 #3 HORZ STAB
 #4 VERT FIN
 #5 RH BIKE RACK.

BIKE POSITIONS:

#1 = LH OUTBOARD #4 = RH IN
 #2 = LH MIDDLE #5 = RH MID
 #3 = LH INBOARD #6 = RH OUT

9 x 5 READINGS = 45

45 = HOVER
 40 = 50 kts
 35 = 60 kts
 30 = 70 kts
 25 = 80 kts
 20 = 90 kts
 15 = 100 kts
 10 = 110 kts
 5 = 120 kts

5 x 5 READINGS = 25

25 = HOVER
 20 = 60 kts
 15 = 80 kts
 10 = 100 kts
 5 = 120 kts

#1 BASELINE
 #2 RH BIKE RACK
 #3 LH BIKE RACK
 #4 BOTH BIKE RACKS
 #5 BOTH RACKS, BIKE @ #1
 #6 BOTH RACKS, BIKE @ #2
 #7 BOTH RACKS, BIKE @ #3
 #8 BOTH RACKS, BIKE @ #4
 #9 BOTH RACKS, BIKE @ #5
 #10 BOTH RACKS, BIKE @ #6
 #11 BOTH RACKS, BIKES @ #5 & 6
 #12 BOTH RACKS, BIKES @ #4 & 5
 #13 BOTH RACKS, BIKES @ #4, 5 & 6
 #14 BOTH RACKS, BIKES @ #4 & 6
 #15 BOTH RACKS, BIKES @ #2 & 3
 #16 BOTH RACKS, BIKES @ #1 & 3
 #17 BOTH RACKS, BIKES @ #1, 2 & 3
 #18 BOTH RACKS, BIKES @ #1, 2, 3, 4, 5 & 6
 #19 BOTH RACKS, BIKES @ #1 & 2
 #20 NO RACKS, DIVE / VNE ONLY

#21 RH RACK LH BASKET NO BIKES
 #22 RH RACK LH BASKET 3 BIKES
 #23 LH RACK RH BASKET NO BIKES
 #24 LH RACK RH BASKET 3 BIKES

Jason Rekve

From: Mat Melsness <MMelsness@blackcombhelicopters.com>
Sent: June 9, 2016 11:00 AM
To: Jason Rekve
Subject: RE: max vibe

Sorry, I was out of town on a film job.

Unfortunately, it is not a simple answer, as it depends on the component. While we typically strive to balance 0.2 IPS or lower on all components in all regimes, the short shaft limit is in fact 0.8, the tail rotor limit is 0.35, and the mains are 0.2 in a hover and at cruise, but 0.35 in a 45° bank. When setting the hammers to reduce the 3 omega vibration, the limit is 0.6 IPS on the pilot side, and 0.7 on the co-pilot side. The MM recommends that it be set at 0.47 IPS at MCP for comfort.

For reference, the mains operate at ~393 RPM, the short shaft ~6000 RPM, and the tail rotor is at ~2040 RPM. 3 omega is at about 1180 RPM.

Cheers,

Mat Melsness

Chief Engineer / Airbus Fleet
Blackcomb Helicopters
1850 Airport Road, Pemberton BC Canada V0N 2L0
Office: (604) 894-5153 - Cell: (604) 966-1126 - Toll Free: (800) 330-4354
Email: mmelsness@blackcombhelicopters.com
Web: www.blackcombhelicopters.com

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From: Jason Rekve [jason@aerodesign.ca]
Sent: Thursday, June 09, 2016 08:36
To: Mat Melsness
Subject: max vibe

Good morning Mat;

Could you let me know the cut-off for vibe analysis asap? I'm sure you are like me in trying to get as close to zero as possible, but what are you trying to get below? Is it .2?

Thanks
Jason

Jason Rekve – M1/M2 AME
President and General Manager, PRM



Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada



APPLICATION FOR A FLIGHT PERMIT

Instructions

Print or type all entries. Reference *Canadian Aviation Regulations Standard 507* for the use and disposition of the form.

A. Aircraft Identification

1. Owner Blackcomb Helicopters		2. Address PO Box 1241 Whistler, BC V0N 1B0	
3. Aircraft Manufacturer Airbus Helicopters			
4a. Model AS350B3	4b. Maximum Permissible Take-Off Weight _____ Kg _____ lb	5. Serial Number	6. Nationality and Registration Marks

B. Purpose of Flight (Check applicable boxes)

- ☐ 1. Ferry flights to a base for repairs or maintenance
- ☐ 2. Delivery, demonstration, market survey, or crew training flights
- ☒ 3. Flights for the purpose of showing compliance with airworthiness standards
- ☐ 4. Other purpose (Specify) _____

C. Flight Description and Aircraft Limitations (Description of flight(s) - Use attachment when appropriate)

1. From Pemberton, BC - CYPS	2. To Pemberton, BC - CYPS	
3. Via None	4. Effective Date (yyyy-mm-dd) 2016-05-30	5. Termination Date (yyyy-mm-dd) 2016-06-30

6. Aircraft does not meet the airworthiness requirements as follows:
**Modified with installation of bicycle rack on approved mounting provisions in accordance with Aero Design Ltd. drawing 100201.
Flight testing in accordance with Flight Test Plan 1002.03 Rev 0, or later accepted revision.
Max flight speed 1.11 Vne (Vd) (see FTP) required.**

7. The following **maintenance** conditions are considered necessary for safe operations:

Aircraft certified as safe and fit for flight by a qualified AME in the aircraft journey logbook prior to flight.

8. The following **operating** conditions are considered necessary for safe operations:

- Day VFR/VMC. -No flight over built up areas.
-Essential Crew only.
-Max flight speed 1.11 Vne (Vd) (see FTP) permitted.
-Draft FMS1002.91 Rev 0, or later accepted revision, is required on board.**

D. Signatures

I hereby certify that the aircraft described above is in a condition for safe operation.

_____ Signature, AME Licence No., ACA No. or RCA No.	_____ Date (yyyy-mm-dd)
And _____ Signature of the Registered Owner or Authorized Representative	_____ Date (yyyy-mm-dd)

**AS350 with Aero Design Bicycle Rack System
Performance**

1. GENERAL

Date: _____

Rotorcraft Type: AS350 _____

Time Up: _____

Time Down: _____

Registration: _____

Location: _____

Serial Number: _____

Pilot: _____

Pilot License Number: _____

Flight Test Engineer: _____

2. INITIAL CONDITIONS

Altimeter Setting: _____

Gross Weight: _____

Fuel: _____

Longitudinal CG: _____

Hp: _____

Lateral CG: _____

OAT: _____

Wind Direction: _____

Wind Speed: _____

**AS350 with Aero Design Bicycle Rack System
Performance**

3. HOVER PERFORMANCE – IGE

TOP: FLI 10, Q 100%, N_G 101.1%, TOT 915°C

Wind Limit: 3 knots, 5 ft skid height

Altitude	Fuel	OAT	Torque	N _G	TOT	N _R

4. CLIMB PERFORMANCE

V_Y 65-1 kt/1000 H_P KIAS. MCP: FLI 9.6, Q 84%, N_G 97.1%, TOT 849°C

Time (seconds)	Altitude	OAT	N _R	VSI	Fuel
Climb Number 1	0				
	30				
	60				
Climb Number 2	0				
	30				
	60				
Climb Number 3	0				
	30				
	60				
Climb Number 4	0				
	30				
	60				

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

1. GENERAL

Date: _____ Rotorcraft Type: AS350

Time Up: _____

Time Down: _____ Registration: _____

Location: _____ Serial Number: _____

Pilot: _____

Pilot License Number: _____

Flight Test Engineer: _____

2. INITIAL CONDITIONS

Altimeter Setting: _____

Configuration: _____

Gross Weight: _____ Fuel: _____

Longitudinal CG: _____ Hp: _____

Lateral CG: _____ OAT: _____

Wind Direction: _____

Wind Speed: _____

3. CONTROL THROWS

Cyclic Fwd:		Pedal Left:	
Aft:		Pedal Right:	
Left:			
Right:			

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

4. GROUND RESONANCE CHECK

(Small Longitudinal / Lateral / Circling cyclic inputs at various Q settings – from 1 to 4 Hz)

Comments:

5. HOVER AND LOW SPEED

Test Limit is 30 knots.

Direction	Speed (Kt)	Long Cyclic Posn	Latl Cyclic Posn	Pedals Posn	Comments (vibration?)
Hover:	0				
Left:	5				
	10				
	15				
	17				
	20				
	25				
	30				
Right:	5				
	10				
	15				
	17				
	20				
	25				
	30				
Aft:	5				
	10				
	15				
	17				
	20				
	25				
	30				

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

6. AIRSPPEED INDICATOR CHECK – GPS 3 LEG METHOD

Technique: Fly steady airspeed, wait for groundspeed to stabilize, Subsequent legs are flown 90 degrees left turn from previous legs. Maximum speed that can be checked is V_H .

Altimeter Setting:

Target Airspeed	Pilot Airspeed	Heading Leg 1	Ground Speed Leg 1	Ground Speed Leg 2	Ground Speed Leg 3	Pressure Altitude	OAT
35							
40							
50							
60							
70							
80							
90							
100							
110							
120							
130							
140							
155							

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

7. MAXIMUM SPEED LEVEL FLIGHT, V_H AT MCP

Aircraft Limits : FLI 9.6 Q 84%, N_G 97.1%, TOT 849°C, V_{NE} – 155-3 kts/1000 ft H_p

V_H : _____ H_p : _____
Long Cyclic Posn: _____
Lat Cyclic Posn: _____ Fuel: _____
Pedal Posn: _____

8. CONTROLLABILITY – V_{NE}

V_{NE} : _____ 155 KIAS Max H_p : _____
Long Cyclic Posn: _____
Lat Cyclic Posn: _____
Pedal Posn: _____ Comments: _____

9. CONTROLLABILITY – TURNS AT V_{NE}

Turns 30° (left / right) – Comments:

Pitch change (nose down / up) – Comments:

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

10. VIBRATIONS – V_D – LEVEL FLIGHT

1.11 V_{NE} : _____ Comments:

11. VIBRATIONS – V_D – AUTO MIN N_R (320)

1.11 V_{NE} : _____ Comments:

12. VIBRATIONS – V_D – AUTO MAX N_R (430)

1.11 V_{NE} : _____ Comments:

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

13. CONTROLLABILITY – TAKE-OFF POWER CLIMB

TOP FLI 10, Q 100%, N_G 101.1%, TOT 915°C, Max 40 KIAS

40 KIAS: _____ Hp: _____

Long Cyclic Posn: _____

Lat Cyclic Posn: _____ Fuel: _____

Pedal Posn: _____

14. CONTROLLABILITY – AUTOROTATION

Includes: Entry into Autorotation – Engine throttle rapidly reduced to idle. Entry Speed greater than V_{NE-AUTO} requires slowing to 1.11*V_{NE-AUTO} to check controllability.
 Manoeuvring in Autorotation – Coordinated turns at 30 degrees of bank.
 Flare effectiveness.
 V_{NE-AUTO} is 125-3 kts/1000 ft Hp.

Airspeed	Torque	Before Entry			After Entry			Transient Characteristics
		Long	Lat	Pedals	Long	Lat	Pedals	
50								
60								
70								
80								
90								
100								
V _{NE-AUTO}								
Start Hp:		OAT:		Fuel:				

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

15. STATIC LONGITUDINAL STABILITY – CLIMB

V_Y 65-1 kt/1000 H_p KIAS. MCP: FLI 9.6, Q 84%, N_G 97.1%, TOT 849°C

Airspeed Target	Actual Airspeed	Long Cyclic Posn
Trim V_Y :		
$0.85 \cdot V_Y$:		
$1.2 \cdot V_Y$:		

16. STATIC LONGITUDINAL STABILITY – CRUISE

Airspeed Target	Actual Airspeed	Long Cyclic Posn
$0.9V_{NE}$ or $0.9V_H$:		
$0.7V_{NE}$ or $0.7V_H$:		
$1.1V_{NE}$ or $1.1V_H$:		

17. STATIC LONGITUDINAL STABILITY AUTOROTATION – HIGH SPEED

$V_{NE-AUTO}$ is 125-3 kts/1000 ft H_p.

Target Airspeed	Actual Airspeed	Long Cyclic Posn
Trim: 90 KIAS		
80 KIAS		
$1.11 V_{NE-OEI}$ KIAS		

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

18. STATIC LONGITUDINAL STABILITY AUTOROTATION – LOW SPEED

Target Airspeed	Actual Airspeed	Long Cyclic Posn
Trim: 50 KIAS		
30 KIAS		
70 KIAS		

19. STEADY HEADING SIDESLIP – CLIMB

V_Y 65-1 kt/1000 H_P KIAS. MCP: FLI 9.6, Q 84%, N_G 97.1%, TOT 849°C

Sideslip limit 10 degrees.

Side Slip Angle	Long Cyclic Posn	Lat Cyclic Posn	Pedal Position	Bank Angle
Ball Centered				
½ Ball Right				
1 Ball Right				
Limit: 10				
Ball Centered				
½ Ball Left				
1 Ball Left				
Limit 10				

AS350 with Aero Design Bicycle Rack System
Flight Characteristics - Systems

20. STEADY HEADING SIDESLIPS – CRUISE – $0.9 \cdot V_{NE}$ OR $0.9 \cdot V_H$

Sideslip limit is 10 degrees

Side Slip Angle	Long Cyclic Posn	Lat Cyclic Posn	Pedal Position	Bank Angle
0				
0.5 R				
1.0 R				
Limit: 10				
0				
0.5 L				
1.0 L				
Limit: 10				

21. HYDRAULICS OFF

Cruise flight to Approach to running landing

Comments:

22. SLOPE LANDINGS

Comments:

REFERENCES

1. 14 CFR Part 27 Federal Aviation Regulations effective February 1, 1965, including Amendments 29-1 through 29-46, **Airworthiness Standards: Normal Category Rotorcraft**, Department of Transportation, Federal Aviation Administration
2. Transport Canada Type Certificate Data Sheet No. 83, Issue 23, 13 January 2016, Airbus Helicopters AS350.
3. Transport Canada Type Certificate Data Sheet No. 87, Issue 9, 29 January 2008, Airbus Helicopters AS355.
4. FAA Advisory Circular 27-2B, Certification of Normal Category Rotorcraft, Change 6, dated 7/25/2014.
5. Aero Design Certification Plan Airbus Helicopters AS350 & AS355 All Models Quick Release Bicycle Rack Installation, CP1002, Revision 3, 20 April 2016.
6. Aero Design Flight Test Plan Airbus Helicopters AS350 & AS355 Quick Release Bicycle Rack, FTP1002.03, Revision 0, 14 September 2015.

1.0 INTRODUCTION

This Supplemental Type Certificate project is for the approval of the Quick Release Bicycle Rack installation on all AS350 and AS355 aircraft. This flight test plan describes how compliance will be shown to the regulations listed in Section 4.0.

2.0 AIRCRAFT DESCRIPTION

The AS350 is a single engine, single main rotor helicopter with a conventional tail rotor. The AS355 is a twin-engine helicopter based on the AS350 design. There are minor differences to the outside lines of the AS355 to accommodate the twin-engine design as well as system differences. The flight characteristics of the AS350 and AS355 aircraft are not significantly different from each other.

3.0 TEST ARTICLE DEFINITION

Each bicycle rack can support up to 3 bikes. The bicycle racks can be installed on either the left, right or both sides of the aircraft. The maximum load per bike is 50 lbs (23 kg). The rack itself consists of 3 parallel tracks made of an aluminum extrusion used for cabin steps, with stainless steel tubing frames to secure the bicycles. The tube frames can accommodate tires from 26" – 29" (660 – 737 mm) diameter and up to 4" (100 mm) wide, standard sizes for mountain and downhill biking. The aft tube frame is fixed in position; the forward frame slides to allow for a tight fit on the range of tire and frame sizes. The forward frame locks to the track with a cam action that puts pressure aft and down on the tire to secure the bicycle tightly into the frame. The cam action will also secure the forward frame from moving when there is no bike on the rack.

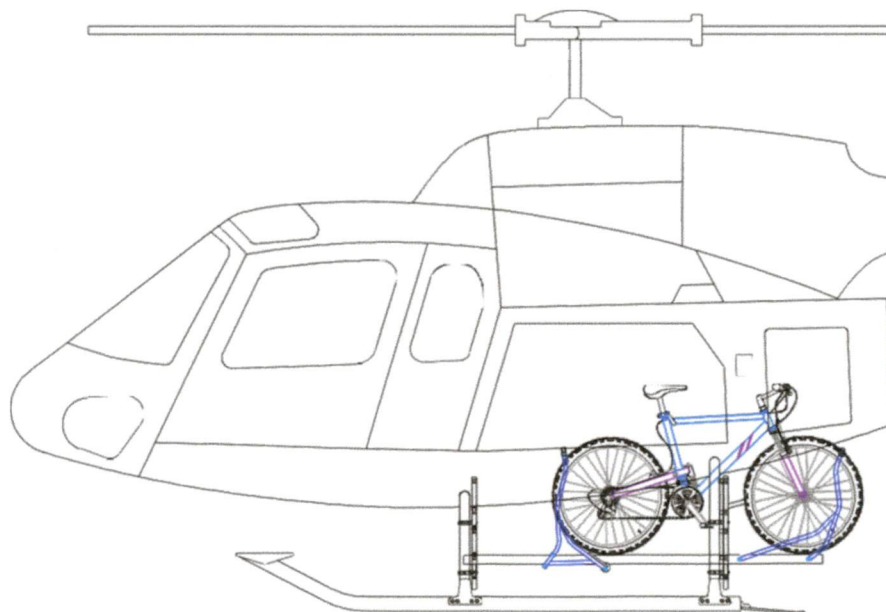


Figure 1: Aero Design Bicycle Rack Installed on Left Side of AS350

4.0 REGULATORY COMPLIANCE

This test plan will demonstrate that the AS350 and AS355 with the Aero Design bicycle rack installed on either the left or right side, and on both of the aircraft complies with the requirements listed in Table 1. The requirements do not include the Category A requirements for the AS355NP, nor does it include the IFR requirements. The STC will include a limitation that Category A operations are prohibited for the AS355NP (Only model AS355 model certified for Category A), and all AS350 and AS355 models are limited to Day and Night VFR. Some of the requirements listed in Table 1 are shared with other engineering specialties.

Table 1 – AS350 Flight Test Certification Requirements

14 CFR	Amendment	Requirement
27.21	27-21	Proof of Compliance
27.25	27-36	Weight Limits
27.27	27-2	Center of Gravity Limits
27.45	27-21	[Performance] General
27.51	27-0	Takeoff
27.65	27-33	Climb - AEO
27.67	27-23	Climb - OEI (AS 355)
27.71	27-44	Autorotation Performance
27.73	27-0	Performance at minimum operating speed
27.75	27-14	Landing
27.79	27-21	Limiting Height-Speed Envelope
27.141	27-21	[Flight Characteristics] General
27.143	27-21	Controllability and maneuverability
27.151	27-21	[Flight controls.]
27.161	27-21	Trim Control
27.171	27-0	Stability: General
27.173	27-21	Static Longitudinal Stability
27.175	27-34	Demonstration of static longitudinal stability
27.177	27-21	Static Directional Stability
27.231	27-0	Ground and water handling characteristics
27.241	27-0	Ground resonance
27.251	27-0	Vibration
27.1301(b)(d)	27-0	Function and installation
27.1309 (b)	27-0	Equipment, systems and installations
27.1323	27-2	Airspeed indicating system
27.1325	27-0	Static air vent system
27.1327	27-0	Magnetic direction indicator
27.1385	27-0	Position light installation
27.1387	27-7	Position light system dihedral angles
27.1389	27-0	Position light distribution and intensities
27.1391	27-0	Minimum intensities in the horizontal plane for forward and rear position lights
27.1393	27-0	Minimum intensities in any vertical plane for forward and rear position lights

Table 1 – Flight Test Certification Requirements (Continued)

14 CFR	Amendment	Requirement
27.1395	27-0	Maximum intensities in overlapping beams of forward and rear position lights
27.1397	27-6	Color specifications
27.1401	27-10	Anti-collision light
27.1501	27-14	General
27.1503	27-0	Airspeed limitations: general
27.1505	27-2	Never exceed speed
27.1523	27-0	Minimum flight crew
27.1525	27-0	Kinds of operation
27.1541	27-0	[Markings and placards] General
27.1543	27-0	Instrument markings: general
27.1545	27-0	Airspeed indicator
27.1547	27-0	Magnetic direction indicator
27.1557	27-0	Miscellaneous markings and placards
27.1559	27-8	Limitations placard
27.1581	27-14	General
27.1583	27-16	Operating limitations
27.1585	27-21	Operating procedures
27.1587	27-21	Performance information
27.1589	27-0	Loading information

5.0 TEST METHOD

The extent of the aircraft modification is such that there is expected to be a moderate increase in drag, both vertically and longitudinally. The modification will likely have a measurable effect on performance and flight characteristics. The general approach to demonstrating compliance will be to compare test results between the unmodified and modified configurations. Aero Design will conduct some development testing before these certification tests to identify what the critical loading is for the bicycle rack installed on the left, right and both sides. The aircraft tests will be conducted on an AS350B2 or AS350B3/B3e in the following configurations: No bicycle rack installed to gather baseline performance and flight characteristics data; bicycle rack installed on left side to gather performance and flight characteristics data in steady state and dynamic flight conditions; bicycle rack installed on the right side to gather performance and flight characteristics data in steady state and dynamic flight conditions; bicycle rack installed on the left and right sides to gather performance and flight characteristics data in steady state and dynamic flight conditions. The take-off GW/CG for all the flights will be kept as constant as practical to eliminate CG variations from introducing error in the performance and flight characteristics comparisons. The performance characteristics will be tested using as far forward a CG as can be practically attained, and the flight characteristics will be tested using as far aft a CG as can be practically attained, while remaining within the AS350 GW/CG limits. All performance testing will be performed with the heater off, which will yield conservative results.

The test conditions to be tested, and the associated configuration and CG can be found in Sections 9.0 and 10.0. Prior to conducting other tests with the bicycle racks installed the three leg GPS PEC method will be used to verify that the position errors are compliant with 27.1323. The PEC will be verified in level flight at speeds between 35 KIAS and V_H or V_{NE} , whichever is lower.

It is expected that there will be a small degradation in hover performance caused by the installation of the bicycle racks, and this will be quantified by the proposed flight tests. Hover performance will be tested in ground-effect (IGE) at a 5-foot skid height using the free hover technique. There is no intention to demonstrate that the height-velocity envelope is unaffected. Autorotation flare effectiveness will be demonstrated at an altitude that permits a power-recovery from the autorotation.

Climb performance will be tested by flying timed climbs through a fixed altitude band. The aircraft will be stabilized at the desired climb speed, V_Y , and the desired power setting MCP prior to entering the test altitude band. Climbs will be flown perpendicular to the wind, and at least two climbs (on reciprocal headings) will be performed for each desired condition.

6.0 FLIGHT TEST INSTRUMENTATION

The aircraft will be fitted with cloth measuring tapes for the longitudinal and lateral cyclic and the directional control pedals. An audio recorder will be installed in the aircraft ICS to record all onboard audio communications, including intercom and radio.

7.0 DESIGN APPROVAL REPRESENTATIVES (DARS)

The flight tests will be flown by Michel Brulotte TCCA DAR 370 (Flight Test Pilot and Flight Analyst). The flight test data will be analyzed, and the flight test report prepared by Michel Brulotte TCCA DAR 370.

8.0 FLIGHT TEST SAFETY

The flight tests will be conducted using a build-up approach starting with more benign test points and progressing towards the edges of the flight envelope. The aircraft will be flown without the bicycle racks installed to get baseline information about the AS350 control positions and flight characteristics before flying the aircraft with the bicycle racks installed. The overall risk level for this project is MEDIUM. A detailed risk assessment is included in Appendix A.

9.0 Ground Tests

Test	Applicable FAR	Comments
Installation Inspection	N/A	Completed by FTP, Aero Design representative, and aircraft mechanic after conformity is completed.
Ground Resonance	29.241	Small amplitude frequency sweeps of the cyclic will be performed to identify the natural frequency of the ground vibration mode(s) to verify that there is positive damping. The test will be repeated at idle at flat pitch; at fly at flat pitch, and at intermediate power settings up to light on skids.
Placards	29.1541	Review Aero Design drawings for location, size and format of proposed placards.

10.0 Flight Tests

Test	Applicable FAR	Comments
System Tests		
Airspeed System PEC	27.1323	The GPS PEC method.
Magnetic Compass	27.1327	Compass Swing – Baseline and both loaded bicycle racks.
Performance Tests¹		
Hover Performance	27.73	Free hover IGE
Climb	27.65, 27.67	V _Y using MCP
Flight Characteristics^{2,3}		
Hover Controllability	27.141, 27.143	Minimum relative wind of 30 knots
Climb Controllability	27.141, 27.143	Verified at MCP and TOP
Cruise Controllability	27.141, 27.143	
Autorotation Controllability	27.141, 27.143	
Static Longitudinal Stability	27.171, 27.173, 27.175,	
Static Directional Stability	27.171, 27.175, 27.177	
Slope Landings	27.231	
Vibration Assessment ⁴	27.251	The aircraft will be flown at 1.11 V _{NE} and 1.11 V _{NE-Auto}
Hydraulic Failure	27.141	Fly in cruise to approach and landing

Notes:

1. The take-off CG will be as far forward as can be practically attained in the test aircraft.
2. The takeoff CG will be as far aft as can be practically attained in the test aircraft.
3. The flight controls and workload will be assessed throughout the flight tests to verify compliance with 27.151, 27.161, 27.171, 27.1523, 27.1525.
4. The bicycle racks will be loaded to the critical loading identified by Aero Design development testing, and with empty bicycle racks. Vibrations will be assessed qualitatively and using maintenance vibration measurement tools.

Appendix A

Hazard Number: 1	Risk Assessment					
Hazard: Exceeding aircraft limits.	Catastrophic	AVOID	HIGH	HIGH	MEDIUM	LOW
Cause: The flight tests will be conducted using an aircraft that the DAR FTP is not current on and with a safety pilot that is not familiar with flight test techniques.	Hazardous	AVOID	HIGH	MEDIUM	MEDIUM	LOW
	Major	HIGH	HIGH	MEDIUM	MEDIUM	LOW
	Minor	MEDIUM	MEDIUM	MEDIUM	LOW	LOW
Effect: Major damage to the aircraft.	No Safety Effect	LOW	LOW	LOW	LOW	LOW
		Frequent	Probable	Occasional	Remote	Improbable
Minimizing Procedures: The DAR FTP will familiarize himself with the aircraft limitations, normal, abnormal and emergency procedures prior to conducting any test flights. The flight test cards will include aircraft limitations that apply to the tests being conducted. The unmodified aircraft will be flown in the baseline configuration before the modified aircraft is flown. The DAR FTP will perform some basic familiarization flying of the aircraft before performing any specific test points. The DAR FTP will fly with a company safety pilot if available, or with a flight test observer. The safety pilot or flight test observer will monitor aircraft parameters and advise the DAR FTP if an aircraft limit is being approached. The safety pilot/flight test observer will be briefed about the intended flight tests. Aircrew Coordination Techniques will be used to ensure that all crew members are aware of what manoeuvre will be conducted next, and which limits apply.						
Emergency Procedures: If aircraft limits are exceeded flight testing will cease and the aircraft will either land as soon as possible or land at another site at the pilots' discretion. Maintenance personnel will be advised of the nature of the exceedance (parameter exceeded, magnitude of exceedance, duration of exceedance, flight condition). Testing will be resumed once maintenance personnel have declared the aircraft serviceable.						
Weather Requirements: Day VMC						
Unmitigated Risk	AVOID	HIGH	MEDIUM	LOW		

Hazard Number: 3	Risk Assessment					
Hazard: Ground Resonance.	Catastrophic	AVOID	HIGH	HIGH	MEDIUM	LOW
	Hazardous	AVOID	HIGH	MEDIUM	MEDIUM	LOW
Cause: The tests conducted will include exciting the ground resonance modes.	Major	HIGH	HIGH	MEDIUM	MEDIUM	LOW
	Minor	MEDIUM	MEDIUM	MEDIUM	LOW	LOW
Effect: Loss of Aircraft, and loss of aircrew.	No Safety Effect	LOW	LOW	LOW	LOW	LOW
		Frequent	Probable	Occasional	Remote	Improbable
Minimizing Procedures: The control inputs used to excite the aircraft ground resonance modes will be small amplitude.						
Emergency Procedures: If the crew notices that the aircraft response is not positively damped the crew will either reduce the throttle to idle (if at a low power setting) or lift into the hover (if at a high power setting).						
Weather Requirements: Day VMC						
Unmitigated Risk	AVOID	HIGH	MEDIUM	LOW		

Hazard Number: 4	Risk Assessment					
Hazard: Loss of Engine power during Low Speed testing.	Catastrophic	AVOID	HIGH	HIGH	MEDIUM	LOW
	Hazardous	AVOID	HIGH	MEDIUM	MEDIUM	LOW
Cause: Engine stall, surge or failure.	Major	HIGH	HIGH	MEDIUM	MEDIUM	LOW
	Minor	MEDIUM	MEDIUM	MEDIUM	LOW	LOW
Effect: Significant aircraft damage and aircrew injury.	No Safety Effect	LOW	LOW	LOW	LOW	LOW
		Frequent	Probable	Occasional	Remote	Improbable
Minimizing Procedures: The low speed testing will be conducted over a runway or taxiway, or if that is not practical a surface that is not soft, to minimize the likelihood of a rollover if the aircraft lands with lateral velocity. The testing will be conducted with the aircraft moving into wind to minimize ground speed. The aircraft will be flown at a height that is higher than the normal hover height, but below the bottom of the H-V avoid curve to allow the crew more time to eliminate lateral velocity prior to landing.						
Emergency Procedures: If an engine failure occurs the pilot will attempt to eliminate lateral velocity prior to aircraft touchdown.						
Weather Requirements: Day VMC						

Hazard Number: 2		Risk Assessment				
Hazard: Loss of Situational Awareness.	HIGH	AVOID	HIGH	HIGH	MEDIUM	LOW
	Hazardous	AVOID	HIGH	MEDIUM	MEDIUM	LOW
Cause: Conducting flight testing in an unfamiliar area.	Major	HIGH	HIGH	MEDIUM	MEDIUM	LOW
	Minor	MEDIUM	MEDIUM	MEDIUM	LOW	LOW
Effect: Mid-air collision with other air traffic or collision with obstacles.	No Safety Effect	LOW	LOW	LOW	LOW	LOW
		Frequent	Probable	Occasional	Remote	Improbable
Minimizing Procedures: The DAR FTP will familiarize himself with the airspace structure in the test area, and which ATC agencies to contact. The DAR FTP will familiarize himself with the location of significant obstacles in the area, to include power lines, towers, or other high obstacles. If TCAS and/or TAWS are available they will be used to help identify air traffic and terrain and obstacle threats. The DAR FTP and the company pilot/flight test observer will maintain a lookout for air traffic and terrain and obstacles. Flight tests will be conducted at altitudes at least 500 ft AGL, except for specific low altitude tests which will be conducted on an airfield, or an airborne reconnaissance of the area will be done before descending below 500 ft AGL.						
Emergency Procedures: The crew will take action to avoid known air traffic, acquired from ATC report, TCAS or visually. The crew will take action to avoid terrain and obstacles acquired either visually or from the TAWS.						
Weather Requirements: Day VMC						
Unmitigated Risk	AVOID	HIGH	MEDIUM	LOW		

Independent Consultancy Agreement

This contract for services is made in duplicate between:

Aero Design Ltd. 9888A Malaspina Road, Powell River, British Columbia, V8A 0G3 (The "Client"); and Polaris Flight Test Services Inc. (the "Consultant") of 335 Osgoode Street, Ottawa, Ontario K1N 1H2.

It is hereby agreed that —

1. The Consultant will provide the Client with the following services as an independent contractor:

a. Consultant Engineering Test Pilot and Flight Test Engineer for the certification flight tests of the Aero Design Bike Carrier System on Airbus Helicopters AS350 and AS355 aircraft. (The "work")

b. The term of this agreement shall commence when signed and shall continue until the Client has obtained TCCA certification of the Bike Carrier System on Airbus Helicopters AS350 aircraft (the "Term"). The agreement may be extended at any time, subject to mutual agreement by the parties.

c. The details of the services, scheduling and location of the work will be as agreed periodically, subject to reasonable notice and mutual agreement.

d. Start and finish times may vary with the understanding that the normal working week day will not exceed 10 consecutive hours per day. Minimum rest periods will be provided as required by the Canadian Aviation Regulations, FARs, or their foreign equivalent if flying outside Canada, whichever is most restrictive.

e. Specific periods of work may be modified subject to mutual agreement to meet program requirements.

2. The Client will pay the Consultant at the following rates:

a. Flight test planning, analysis or report preparation from the Consultant's office in Ottawa: 100 CAD/hour + HST. There are no minimum work period durations for work performed by the Consultant in the Ottawa office.

b. Any work, other than conducting ground or flight tests, that must be conducted at a

deployed location (away from Ottawa): 100 CAD/hour + HST. There is a minimum of 4 hours of billable work per day when working from a deployed location.

c. When conducting ground or flight tests: 1200 CAD/day + HST.

d. When traveling to a deployed workplace: 60 CAD/hour + HST of travel time. The travel time is calculated as being one hour prior to the scheduled departure time of the first flight to the arrival at the deployed location.

3. The Client will pay the Consultant a subsistence allowance of 100 CAD/day, unless a different rate is mutually agreed in advance.

4. Insurance Coverage - The Client will ensure that the owners of the aircraft in which the Consultant provides services under this contract, provide insurance that covers the aircraft and third party liability as required by local regulations and legislation. The consultant is not responsible for the insurance coverage of the aircraft or for third party liability associated with operation of the aircraft on the ground or in-flight.

5. The Consultant will make travel arrangements to deployed work locations based on the Client's schedule and will bill the Client for the travel expenses (airline tickets, train tickets, ferry charges, rental car expenses, taxis etc). The Consultant will book Economy Class air travel to deployed work locations, unless a different class of air travel is mutually agreed in advance. The Consultant will book an intermediate size rental car, or its equivalent, unless a different rental vehicle class is mutually agreed in advance. If the deployed work period exceeds 14 days then the Client will pay for Economy Class air travel for a weekend trip home giving the Consultant a minimum of two days at home for each trip home, exclusive of travel time.

6. The Client will reimburse the Consultant for the costs of accommodation at the deployed work location(s), and at any required stops enroute. The charges to be reimbursed by the Client will be for the accommodation, internet service, parking, and any applicable taxes.

7. The Client will obtain the necessary Work Permits and foreign license validations on behalf of the Consultant whenever these are required. The Client will arrange and pay for any flight training and licensing fees, including type ratings, and check-rides that are required for the Consultant to be able to fly aircraft that the Client assigns the Consultant to fly in as a flight crew member.

Independent Consultancy Agreement

8. The Client will provide the Consultant access to technical manuals (Flight Manuals, Pilot's Guides, Quick Reference Handbooks etc) required by the Consultant to prepare for the ground and flight tests.

9. The Consultant agrees to comply with the provisions of all applicable federal, provincial, state and local laws, rules and regulations and shall indemnify and save harmless the Client from any and all claims and demands of other parties for or arising out of the Consultant's breach of such laws or regulations, unless such a breach was due to the Client being in breach of the provisions of Sections 4 or 7 of this contract.

10. The Client agrees to comply with the provisions of all applicable federal, provincial, state and local laws, rules and regulations and shall indemnify and save harmless Polaris Flight Test Services Inc. from any and all claims and demands of other parties for or arising out of the Client's breach of such laws or regulations.

11. Neither this Agreement nor any interest herein nor claim hereunder may be assigned or delegated by the Consultant, nor may any of this Agreement be further subcontracted by the Consultant without the prior written consent of the Client.

12. Payment terms are within two weeks (14 days) of receipt of invoice (electronic or hard copy). Invoices shall be considered received:

- a. Right away, if delivered in person;
- b. One day after sending it, if sent by fax or e-mail; or
- c. 5 days after mailing, if by mail.

13. The terms of this contract may only be amended in writing signed by both parties.

14. This contract is governed by the laws of the Province of Ontario.

15. This agreement may be terminated by either party for failure of the other party to substantially comply with the terms of this Agreement, at its sole discretion. In no case, however, shall such termination negate the provisions.

16. All notices and correspondence shall be given by letter or telefax or e-mail addressed as follows or such other address as one party may designate in writing to the other as below.

17. The parties acknowledge and agree that nothing herein creates, or shall be interpreted as creating, a relationship of employer/employee or master/servant as between the Client and the Consultant. It is expressly understood that the services provided hereunder by the Consultant are provided on an independent contractor basis.

18. This Agreement is the whole Agreement between the Client and the Consultant and nothing else in writing or said orally at any time in the past adds to, takes away from or changes this Agreement.

19. The provisions of this Agreement shall be binding upon the Parties and their permitted respective successors and assigns.

Signed for and on behalf of the Client:



JEFF CLARKE, VICE PRESIDENT

AERO DESIGN LTD.

email: jeff@aerodesign.ca

604-483-2376

Signed for and on behalf of Polaris Flight Test Services Inc.



Michel Brulotte, Director
Polaris Flight Test Services Inc.
email: michel.brulotte@primus.ca
1(613) 220-8821

Independent Consultancy Agreement

This contract for services is made in duplicate between:

Aero Design Ltd. 9888A Malaspina Road, Powell River, British Columbia, V8A 0G3 (The "Client"); and Polaris Flight Test Services Inc. (the "Consultant") of 335 Osgoode Street, Ottawa, Ontario K1N 1H2.

It is hereby agreed that —

1. The Consultant will provide the Client with the following services as an independent contractor:

a. Consultant Engineering Test Pilot and Flight Test Engineer for the certification flight tests of the Aero Design Bike Carrier System on Airbus Helicopters AS350 and AS355 aircraft. (The "work")

b. The term of this agreement shall commence when signed and shall continue until the Client has obtained TCCA certification of the Bike Carrier System on Airbus Helicopters AS350 aircraft (the "Term"). The agreement may be extended at any time, subject to mutual agreement by the parties.

c. The details of the services, scheduling and location of the work will be as agreed periodically, subject to reasonable notice and mutual agreement.

d. Start and finish times may vary with the understanding that the normal working week day will not exceed 10 consecutive hours per day. Minimum rest periods will be provided as required by the Canadian Aviation Regulations, FARs, or their foreign equivalent if flying outside Canada, whichever is most restrictive.

e. Specific periods of work may be modified subject to mutual agreement to meet program requirements.

2. The Client will pay the Consultant at the following rates:

a. Flight test planning, analysis or report preparation from the Consultant's office in Ottawa: 100 CAD/hour + HST. There are no minimum work period durations for work performed by the Consultant in the Ottawa office.

b. Any work, other than conducting ground or flight tests, that must be conducted at a

deployed location (away from Ottawa): 100 CAD/hour + HST. There is a minimum of 4 hours of billable work per day when working from a deployed location.

c. When conducting ground or flight tests: 1200 CAD/day + HST.

d. When traveling to a deployed workplace: 60 CAD/hour + HST of travel time. The travel time is calculated as being one hour prior to the scheduled departure time of the first flight to the arrival at the deployed location.

3. The Client will pay the Consultant a subsistence allowance of 100 CAD/day, unless a different rate is mutually agreed in advance.

4. Insurance Coverage - The Client will ensure that the owners of the aircraft in which the Consultant provides services under this contract, provide insurance that covers the aircraft and third party liability as required by local regulations and legislation. The consultant is not responsible for the insurance coverage of the aircraft or for third party liability associated with operation of the aircraft on the ground or in-flight.

5. The Consultant will make travel arrangements to deployed work locations based on the Client's schedule and will bill the Client for the travel expenses (airline tickets, train tickets, ferry charges, rental car expenses, taxis etc). The Consultant will book Economy Class air travel to deployed work locations, unless a different class of air travel is mutually agreed in advance. The Consultant will book an intermediate size rental car, or its equivalent, unless a different rental vehicle class is mutually agreed in advance. If the deployed work period exceeds 14 days then the Client will pay for Economy Class air travel for a weekend trip home giving the Consultant a minimum of two days at home for each trip home, exclusive of travel time.

6. The Client will reimburse the Consultant for the costs of accommodation at the deployed work location(s), and at any required stops enroute. The charges to be reimbursed by the Client will be for the accommodation, internet service, parking, and any applicable taxes.

7. The Client will obtain the necessary Work Permits and foreign license validations on behalf of the Consultant whenever these are required. The Client will arrange and pay for any flight training and licensing fees, including type ratings, and check-rides that are required for the Consultant to be able to fly aircraft that the Client assigns the Consultant to fly in as a flight crew member.

Independent Consultancy Agreement

8. The Client will provide the Consultant access to technical manuals (Flight Manuals, Pilot's Guides, Quick Reference Handbooks etc) required by the Consultant to prepare for the ground and flight tests.

9. The Consultant agrees to comply with the provisions of all applicable federal, provincial, state and local laws, rules and regulations and shall indemnify and save harmless the Client from any and all claims and demands of other parties for or arising out of the Consultant's breach of such laws or regulations, unless such a breach was due to the Client being in breach of the provisions of Sections 4 or 7 of this contract.

10. The Client agrees to comply with the provisions of all applicable federal, provincial, state and local laws, rules and regulations and shall indemnify and save harmless Polaris Flight Test Services Inc. from any and all claims and demands of other parties for or arising out of the Client's breach of such laws or regulations.

11. Neither this Agreement nor any interest herein nor claim hereunder may be assigned or delegated by the Consultant, nor may any of this Agreement be further subcontracted by the Consultant without the prior written consent of the Client.

12. Payment terms are within two weeks (14 days) of receipt of invoice (electronic or hard copy). Invoices shall be considered received:

- a. Right away, if delivered in person;
- b. One day after sending it, if sent by fax or e-mail; or
- c. 5 days after mailing, if by mail.

13. The terms of this contract may only be amended in writing signed by both parties.

14. This contract is governed by the laws of the Province of Ontario.

15. This agreement may be terminated by either party for failure of the other party to substantially comply with the terms of this Agreement, at its sole discretion. In no case, however, shall such termination negate the provisions.

16. All notices and correspondence shall be given by letter or telefax or e-mail addressed as follows or such other address as one party may designate in writing to the other as below.

17. The parties acknowledge and agree that nothing herein creates, or shall be interpreted as creating, a relationship of employer/employee or master/servant as between the Client and the Consultant. It is expressly understood that the services provided hereunder by the Consultant are provided on an independent contractor basis.

18. This Agreement is the whole Agreement between the Client and the Consultant and nothing else in writing or said orally at any time in the past adds to, takes away from or changes this Agreement.

19. The provisions of this Agreement shall be binding upon the Parties and their permitted respective successors and assigns.

Signed for and on behalf of the Client:



JEFF CLARKE, VICE PRESIDENT

AERO DESIGN LTD.

email: jeff@aerodesign.ca

604-483-2376

Signed for and on behalf of Polaris Flight Test Services Inc.

Michel Brulotte, Director
Polaris Flight Test Services Inc.
email: michel.brulotte@primus.ca
1(613) 220-8821



Transport
Canada

Transports
Canada

DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur		Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque		Model / Modèle		Registration / Immatriculation	
Airbus Helicopters		AS350/355		All eligible	
				Serial No. / N° du série	
				All eligible	
				Part No. / N° de la pièce	
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input checked="" type="checkbox"/> STC CTS				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)				<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)				<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type				<input type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée.	
<input type="checkbox"/> Revision No. _____ Révision N° _____				<input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère	
<input type="checkbox"/> Restricted Category Type of Operation Catégorie restreinte Type d'opération				Identify Identifier _____	
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails.					
Quick Release Bicycle Rack Installation This new approval utilizes the quick release mounting provisions from Aero Design's AS350/355 Cargo Basket STC SH08-16.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT		Issue No. / N° de l'édition		Identify State of Design / Identifier l'état de conception	
AS350; H-83 and AS355; H-87		AS350; 23 and AS355; 9		France	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable _____					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification				✓	
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)				✓	
Applicant's remarks / Remarques du demandeur					
NAPA file P-15-0157. This revised application is to remove the EC130B4 model. The certification plan and other compliance documents have been updated to suit.					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
Name and Signature of Applicant / Nom et signature du demandeur		Title / Poste		Date (yyyy-mm-dd) / Date (aaaa-mm-jj)	
JEFF CLARKE		VICE PRESIDENT		2016-04-08	

Jeff Clarke

From: Chan, Michael [Michael.Chan@tc.gc.ca]
Sent: December 10, 2015 3:57 PM
To: 'Jeff Clarke'
Subject: RE: P-15-0157: AS350/EC130 Bike Racks

Hi Jeff,

- With multiple rotorcraft types proposed, please ensure that SI 521-005 section 9.2 and Appendix H are observed. ✓
- The following should also be addressed:
 - o 27.21 – Proof of compliance ✓
 - o 27.610 - Lightning protection ✓
 - o 27.865 - <this item is subject to internal discussion>
- ✓ If support for AS355 Category A operations is being sought, FAR 29 regulations are applicable iaw TCDS H-87.
- ✓ - TCCA LOI will be "Review for Info" for all delegated items
- 27.1387 and 27.1401 seem to be missing from section 7.0 of CP1002 ✓
- Conformity inspections will be conducted by TCCA prior to the proposed tests, unless otherwise agreed to.
- All test plans: please ensure that SI 521-004 sections 8.4 through 8.7 are addressed (as applicable)...eg. calibration records + w. tracing
- Flight test plans: will vibration analysis equipment be used for the AS350 test as stated in CP1002? What is the pass/fail criteria?

Regards,

Michael Chan

Regional Engineer, Aircraft Certification, Civil Aviation
 Transport Canada / Government of Canada
michael.chan@tc.gc.ca / Tel: 604-666-8458 / Fax: 855-618-6288

Ingénieur régional, Certification des aéronefs, Aviation Civile
 Transports Canada / Gouvernement du Canada
michael.chan@tc.gc.ca / Tél: 604-666-8458 / Fax: 855-618-6288

Cert Plan pdf
 for rev levels.

CP1002-1-2015-9-23

Jeff Clarke

From: Chan, Michael [Michael.Chan@tc.gc.ca]
Sent: December 11, 2015 11:44 AM
To: 'Jeff Clarke'
Subject: RE: P-15-0157: AS350/EC130 Bike Racks

Jeff,

Upon consultation with Ottawa, the proposed bike rack is considered an "external load" and not a "cargo compartment". FAR 27.865 is therefore applicable – please revise the CP accordingly. Discussion follows:

I don't think that the bike rack can be considered a cargo compartment since the cargo is not fully enclosed by the compartment. In fact the retention of the cargo (bike) is related to the strength of the cargo (bike wheels, frame, fork). I think that it better fits the external load definition found below. In fact based on the FAR 1 definitions ski baskets and cargo pods should also be considered external loads since they are carried outside the fuselage.

FAR 1 definitions:

External load means a load that is carried, or extends, outside of the aircraft fuselage.

External-load attaching means means the structural components used to attach an external load to an aircraft, including external-load containers, the backup structure at the attachment points, and any quick-release device used to jettison the external load.

Rotorcraft-load combination means the combination of a rotorcraft and an external-load, including the external-load attaching means. Rotorcraft-load combinations are designated as Class A, Class B, Class C, and Class D, as follows:

- (1) *Class A rotorcraft-load combination* means one in which the external load cannot move freely, cannot be jettisoned, and does not extend below the landing gear.
- (2) *Class B rotorcraft-load combination* means one in which the external load is jettisonable and is lifted free of land or water during the rotorcraft operation.
- (3) *Class C rotorcraft-load combination* means one in which the external load is jettisonable and remains in contact with land or water during the rotorcraft operation.
- (4) *Class D rotorcraft-load combination* means one in which the external-load is other than a Class A, B, or C and has been specifically approved by the Administrator for that operation.

As for the concern that FAR 133 would not allow passengers when the bikes are carried, FAR 133.1(d) allows for the carriage of personnel that are not crew or essential to the external load operation as long as it is certified as a Class D load. So the bike rack would require a specific FAR 133 Class D approval to carry passengers and bikes.

Regards,

Michael Chan

Regional Engineer, Aircraft Certification, Civil Aviation
 Transport Canada / Government of Canada
michael.chan@tc.gc.ca / Tel: 604-666-8458 / Fax: 855-618-6288

Ingénieur régional, Certification des aéronefs, Aviation Civile
 Transports Canada / Gouvernement du Canada
michael.chan@tc.gc.ca / Tél: 604-666-8458 / Fax: 855-618-6288

↳ the person is external!!

eg. HEC

133.35 → No passengers

↳ not allowed for part 27 A/C
 AC 27-1B / 133.45(e)

Jeff Clarke

From: Chan, Michael [Michael.Chan@tc.gc.ca]

Sent: October 16, 2015 4:27 PM

To: 'Jeff Clarke'

Subject: RE: Airbus Helicopters EC130 Cargo Basket and Bike Racks

Hi Jeff,

Domestic (and foreign) *operational* rules aside, the proposed mod is an external load carrying device where bicycles are considered the cargo/external load. Therefore, both *design* rules 27.865 and 27.787 are applicable.

Since certification for multiple rotorcraft models is requested, please ensure that the proposed data package meets the "Approved Model List" requirements of SI 521-005 section 9.2 and Appendix H.

Once the certification plan is revised accordingly, LOI determination and cert plan acceptance will follow.

Regards,

→ can't find

Michael Chan

Regional Engineer, Aircraft Certification, Civil Aviation

Transport Canada / Government of Canada

michael.chan@tc.gc.ca / Tel: 604-666-8458 / Fax: 855-618-6288

Ingénieur régional, Certification des aéronefs, Aviation Civile

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30/11/2015

1/13/14

8900.1 CHG 240

VOLUME 3 GENERAL TECHNICAL ADMINISTRATION**CHAPTER 51 PART 133 EXTERNAL-LOAD OPERATIONS****Section 1 Introduction to Part 133 Related Tasks**

3-4081 EXTERNAL-LOAD OPERATIONS. See the following documents for guidelines for certification and surveillance of Title 14 of the Code of Federal Regulations (14 CFR) part 133:

- Volume 2, Chapter 7, Section 1;
- Volume 3, Chapter 51, Sections 2–6;
- Volume 5, Chapter 10, Section 1; and
- Volume 6, Surveillance, Chapter 5, Sections 1–3.

3-4082 WEB-BASED OPERATIONS SAFETY SYSTEM (WebOPSS) AUTHORIZATIONS. This guidance change requires aviation safety inspectors (ASI) to use WebOPSS to issue authorizations to rotorcraft external-load operators. ASIs may comply with this requirement immediately or may elect to issue the authorizations the next time an operator renews his or her certificate. All part 133 operators must have all required and applicable optional authorization paragraphs documented in WebOPSS within 25 months of the date of this change.

NOTE: Authorizations issued to part 133 operators are *not* subject to 14 CFR part 119 requirements and therefore are *not* referred to as “operations specifications.”

3-4083 PART 133 HIGHLIGHTS.

- A. Civil Operators.** All civil rotorcraft external-load operators must have certification.
- B. Restricted Category Rotorcraft.** Part 133 permits external-load operations with restricted category rotorcraft except over certain areas.
- C. Certificate Expiration.** Certificates issued under part 133 are valid for a period of 24 calendar-months per part 133, § 133.13.
- D. Congested Area Operations.** Operators must have an approved Congested Area Plan (CAP) before operating over congested areas.
- E. Instrument Flight Rules (IFR) Operations.** The Administrator must specifically approve IFR external-load operations per § 133.33(f). List IFR authorizations in WebOPSS.
- F. Operations Flight Characteristic Demonstration.** New operators need not comply with the requirements for an operational flight characteristic demonstration if the manufacturer already performed a demonstration. The Rotorcraft Flight Manual (RFM) for each rotorcraft contains this information.

3-4084 CLASSES OF AUTHORIZATION.

A. Class A External Loads. Class A is a non-jettisonable external load that cannot move freely and does not extend below the landing gear. An example of a Class A operation is the carriage of supplies in an approved cargo rack, bin, or fixture affixed to the exterior of the rotorcraft. A cargo rack certification may or may not include a cargo envelope. The Federal Aviation Administration (FAA)-approved Rotorcraft Flight Manual Supplement (RFMS) required for the cargo rack installation specifies the approved configuration. If the cargo carried is within the envelope specified in the RFMS, the rotorcraft operator may operate in accordance with 14 CFR part 91 or 135. Rotorcraft operators must conduct flight operations in accordance with part 133 when the cargo rack certification does not include a cargo envelope or the cargo carried exceeds the specified envelope.

B. Class B External Loads. Class B is a jettisonable external load, carried above or below the skids, that a cargo hook or winch lifts free of land and/or water. An example of a Class B operation is the placement of an air conditioning unit on the roof of a tall building.

C. Class C External Loads. Class C is a jettisonable external load where a portion of the load remains in contact with land or water. Examples of Class C operations are wire stringing, dragging a long pole, or towing a boat or barge.

D. Class D External Loads. Class D is an external load other than Class A, B, or C and approved on an individual basis through the issuance of a WebOPSS authorization (paragraph A044). Class D allows the external carriage of a person other than a crewmember or a person who is essential to and directly connected with the external load operation, in an FAA-approved personnel lifting device with a transport Category A multiengine helicopter.

3-4085 OPERATING RULES.

A. Rotorcraft-Load Combination Flight Manual (RLCFM). Conduct rotorcraft external load operations in accordance with the RLCFM prescribed in § 133.47. The rotorcraft operation must comply with § 133.45; the operating certificate authorizes the rotorcraft and rotorcraft-load combination.

B. Carriage of Persons. Part 133 does not provide for “passenger-carrying” operations, but does provide for the “carriage of persons” in accordance with § 133.35. If conducting passenger-carrying operations, the operation must comply with part 91 or 135. No Class A, B, or C external-load operator may allow passenger carrying during external-load operations unless the person carried is a flightcrew member, is a flightcrew member trainee, performs an essential function in connection with the external-load operation, or is necessary to accomplish the work activity directly associated with the external-load operation. An operator with Class D external-load approval may receive authorization to transport persons externally who are other than a crewmember or not directly associated with the external-load operation.

1) The carriage of snow skis as a Class A external-load when skiers are onboard the rotorcraft is clearly a passenger-carrying operation that is not permitted under the provisions of § 133.35. Carrying passenger baggage in a Class A external-load attaching means (such as racks on top of fixed floats) with passengers aboard is another example of an operation not permitted by § 133.35.

NOTE: However, if using approved cargo racks (Supplemental Type Certificate (STC) or other approval), then the operator could conduct the operation under part 91 or 135, which both allow for carrying passengers.

2) The carriage of a sensor package as a Class B external-load when technicians are onboard the rotorcraft is clearly a carriage of persons operation that is permitted under the provisions of § 133.35. This applies if they are operating the equipment en route, assisting with placing the equipment upon arrival, or operating the equipment after positioning.

3) Under § 133.35, an operator with a Class B approval is authorized to externally carry a crewmember, or a person essential to the external-load operation, with a single-engine or multi-engine rotorcraft, in accordance with applicable operating limitations. If RFM or RFMS operating limitations, markings, or placards contain language prohibiting use for Human External Cargo (HEC), operators of civil rotocraft must comply with those limitations in accordance with 14 CFR § 91.9(a) (e.g., an RFMS limitation such as, “the cargo hook is approved for non-human cargo, class B rotocraft load combinations only”). The RFM or RFMS may also include additional limitations indicating certification for HEC such as, “the external load system meets the 14 CFR part 27 certification requirements for Human External Cargo (HEC).” The operator may carry the persons in the following examples as a Class B external load, which must be jettisonable.

- a) Power line patrol/maintenance personnel.
- b) Rescue personnel who are performing emergency medical and rescue services.

4) A Class D rotorcraft load combination is the only external-load class that permits the carriage of persons other than crewmembers or persons essential and directly connected with the external-load operation (refer to § 133.1(d)). Examples of persons who would have to be carried as a Class D external-load are harbor pilots who are being transported from the land to a ship, or ship-to-ship, in a personnel lifting device; or a person being rescued using a personnel lifting device. Conduct a Class D external-load operation only in accordance with the following:

- a) The rotorcraft used must be type certificated (TC) in accordance with transport Category A requirements for its operating weight. It must provide hover capability with one engine inoperative at that operating weight and altitude when carrying a Class D load.
- b) The rotorcraft must be equipped for direct radio intercommunication among required crewmembers.
- c) The personnel lifting device must be FAA-approved and have an emergency release that requires two distinct actions to achieve release (e.g., a hoist must have a cable cutter with one guarded switch that requires the pilot to raise the guard before activating the switch. The guard must prevent the pilot from activating the switch inadvertently).

5) The test for determining whether it is appropriate to externally carry a person as a Class B versus a Class D external-load combination is considering the standard industry practices for the work activity carried out. If the person performs an essential function in connection with the external-load operation, or is necessary to accomplish the work activity directly associated with that external-load operation, the operator is authorized to transport the person as a Class B external-load combination. If the person does not perform an essential function in connection with the external-load operation, or is not necessary to accomplish the work activity directly associated with that external-load operation, then the operator is required to transport the person as a Class D external-load combination (refer to § 133.35(a)(3) or (4)). Regardless of the operational load class, in accordance with 14 CFR § 91.9(a), operators of civil rotocraft must comply with operating limitations

specified in the RFM or RFMS, markings, and placards, including those applicable to HEC.

6) In an emergency involving the safety of persons or property, the certificate holder may deviate from the rules of part 133 to the extent required to meet that emergency. The test to determine whether a deviation is necessary is the availability of alternate means of resolving the situation.

a) Rescue of property must be clearly in the public interest in order to warrant deviation from the operating rules and related requirements.

b) Under the emergency operating authority (§ 133.31(b)), the FAA may request a complete report for each deviation from part 133. This may be necessary to determine whether there has been a violation of the rule and to ensure that the operator has not misused the authority granted by the provisions of § 133.31(a) to use an emergency situation to circumvent the rules. The report should give a thorough, detailed account of the operation, a description of the act of deviation, and a justification for the deviation. File the report within 10 days of the request by the Administrator.

3-4086 FOREIGN-REGISTERED ROTORCRAFT.

A. Canadian-Registered Rotorcraft. U.S. operators may add Canadian-registered rotorcraft to a Rotorcraft External-load Operating Certificate in accordance with the following conditions:

1) Operators and new applicants for a part 133 Rotorcraft External-load Operator Certificate must have and maintain the exclusive use of at least one rotorcraft that is U.S.-registered and meets the requirements of § 133.19.

2) Any Canadian-registered rotorcraft added to a part 133 Rotorcraft External-load Operating Certificate and used in part 133 operations must:

a) Be TC'd under part 27 or 29, the regulations preceding those parts, or 14 CFR part 21, § 21.25.

b) Hold a U.S. TC in the normal or restricted category.

c) Meet the original type design or properly altered condition.

d) Have records showing maintenance in accordance with the manufacturer's instructions for continued airworthiness (ICA) and the regulations of the country of registry.

e) Undergo an airworthiness inspection prior to addition to a part 133 certificate.

B. North American Free Trade Agreement (NAFTA). Certain Specialty Air Services (SAS) authorized by NAFTA require use of rotorcraft external loads. NAFTA operators do not require part 133 certification because they hold equivalent authorization from their respective NAFTA Civil Aviation Authority (CAA). However, the rotorcraft authorized by a NAFTA Certificate of Authority (COA) must have an original FAA or Transport Canada Civil Aviation (TCCA) civil TC. Ex-military aircraft that have restricted-category certification based on military experience only are not eligible. For more information, see Volume 12, Chapter 1, Section 4.

3-4087 RENEWAL, AMENDMENT, CANCELLATION. A rotorcraft external-load operator certificate expires at the end of the 24th month after the month it was issued or renewed (§ 133.13). In the event the operator's certificate was lost or destroyed, the operator may get a replacement upon written request to the certificate-holding district office (CHDO). The duplicate certificate is a copy of the currently effective certificate and is marked "duplicate" with the date of reissuance.

A. Renewal. The applicant must send FAA Form 8710-4, Rotorcraft External-load Operator Certificate Application, to the CHDO to apply for renewal of a rotorcraft external-load operator certificate. The certificate holder should apply for renewal at least 30 days before expiration of the certificate.

- 1) Process an application for renewal of a certificate in the same manner as for original issuance.
- 2) Compare the renewal application with the expiring certificate. If no substantial changes are noted and the operator has a good record of compliance, the responsible inspector may issue a new certificate without conducting a comprehensive inspection.

B. Amendment. The CHDO generally processes amendments to a part 133 operator's certificate. The FAA may also amend an operator's certificate, in the interest of safety in air commerce, as the result of actions taken under Title 49 of the United States Code (49 U.S.C.) § 44709, and 14 CFR part 13.

- 1) Examples of amendments or approval of operator amendments:
 - WebOPSS authorizations: additional authorization, no longer qualified for authorization.
 - RLCFM: a change in procedures, add a class of operation.
 - Certificate: add or delete class authorization, a change to the rotorcraft list attached to the certification, a change of name (not ownership).
 - Training program: a change in equipment (winch, rotorcraft, or other lifting device) or type of operations, including change in type of winch.
- 2) An operator desiring to amend a rotorcraft external-load certificate must apply using the appropriate section of FAA Form 8710-4.
- 3) The inspector determines if the amendment requires any additional inspections and/or tests.
- 4) External-load operators seldom confine their operations to one geographic area. To prevent imposing undue hardship on industry, a local Flight Standards District Office (FSDO) that does not hold the certificate may approve additional authorizations. However, the local FSDO must coordinate this activity with the CHDO.
 - a) Preferably, the local FSDO will contact the CHDO to have the authorization entered into WebOPSS. The local FSDO can then print and have the operator sign the authorization. Forward the original authorization and supporting documentation to the CHDO.
 - b) Alternatively, the local FSDO may issue (after coordination with the CHDO) the operator a letter of authorization (LOA), valid for 60 days, stating the operator met the requirements for the particular authorization sought. The operator must carry the LOA or a facsimile aboard the rotorcraft, along with a copy of the original external-load certificate and the list of authorized rotorcraft. The local FSDO forwards a copy of the

LOA, the completed original FAA Form [8710-4](#), and any other supporting documentation to the CHDO. Amend the certificate or WebOPSS authorizations to include the additional authorization. Send the amendments to the operator within 60 days.

5) To add or delete a rotorcraft from the list of approved rotorcraft, the operator should fill out the appropriate section on FAA Form [8710-4](#). The authorization must reflect the addition or deletion of a rotorcraft.

a) The assigned inspector must perform all necessary inspections prior to adding a rotorcraft.

b) The FSDO issues a new list of approved rotorcraft. A new certificate is not required.

6) If the application, additional documents, and demonstrations indicate compliance with the appropriate regulations, issue an amended certificate and/or list of approved rotorcraft.

C. Cancellation. The Administrator may amend, suspend, or revoke an external-load operator's certificate under 49 U.S.C. § 44709 and 14 CFR part [13](#).

1) An inspector may amend, suspend, or revoke the certificate for the same reasons that would have been cause for denying application of the original certificate (refer to the current edition of FAA Order [2150.3](#), FAA Compliance and Enforcement Program). The requirements for continuing to hold a certificate are never less than the requirements for original certification. Use discretion. For example, an operator may have only one rotorcraft. If that rotorcraft is temporarily out of service for maintenance or replacement, etc., that may not be grounds for revoking the certificate because they do not have "the exclusive use of at least one rotorcraft."

2) An operator may voluntarily elect to discontinue operations. The operator must voluntarily surrender the operating certificate by correspondence which should state that the operator understands that he or she will have to meet all initial certification requirements in order to reapply. In any case, if the operator does not resume operations within 2 years, the operator must surrender the operating certificate to the CHDO (§ [133.27\(c\)](#)).

RESERVED. Paragraphs 3-4088 through 3-4105.

The drag loads look excessive especially the rack.

I would prefer to see a loads summary. Added

Please add a 40 lb Bike Column. ✓

4.4.1 Drag Load

How does the rack present 1.4 ft² frontal area? Confirmed, single plane area is 1.4 ft²

Ok ✓

i.e.; Frontal frame area is only the max area in a single plane.

However if a Mountain Bike has a 1.5 ft² area the 1.4 ft² Rack area looks reasonable.

and Rack Cd = 1.5 max for Open Frame, Rounded Edges per Hdbk pages
looks conservative wrt the Mountain Bike's Cd = 1.1 Done Ok ✓

Bike design drag is at Vd = 110 kias FMS Vne * 1.11 Vd/Vne = 122.1 kts = 206.1 ft/sec

Per Chart the area of a Perfect Bike (25 lbs?) = 1.2 ft² and Cd = 1.1

Area 50 lb Mountain Bike = $1.2 * (50/25)^{.333} = 1.51 \text{ ft}^2$ fixed square-cube calc. Ok ✓

Mnt Bike drag limit = $.00238 * 206^2 * 1.5 * 1.1/2 = 83.3 \text{ lbs}$

Mnt Bike drag ult = 1.5 Limit = 125.0 lbs

Sta/s and WL/s for the aerodynamic centers? Inserted Ok ✓
and explain how the vertical landing loads are more significant.

Why bother with the 172 kt drag calcs on bikes? Removed

Do you need two sets of calcs?

1) Rack/s only Vd @ 155 Vne/.9 = 172 kts ✓

2) Rack/s w/Bikes Vd @ 110 Vne/.9 = 122 kts Done

Need Beam Drag values for 5.6.3, Helicopter Reactions. Done

4.3.3 Sideward Emergency

You don't want to consider 2 @ 40 lbs and 1 @ 50 lbs? Done Ok

If not please include a conservative note.

5.1 P drag ult 50 bike = 159 lbs

P drag ult 40 bike = 137 lbs please add. ✓

5.2 Negative Maneuvering Condition

Each bike must be retained by the rack's fixed and sliding wheel frames in the ultimate negative maneuvering condition. The required applied load for the 50 lb bike is: ✓

i.e.; you have two different items to analyze and test; the wheel frame kits and the overall rack kit. [pick another term for wheel frames?] ✓

5.5 Sideward Emergency

At least $(40 + 40 + 50) * 2 = 260 \text{ lbs}$ shown with moment arm/s

Please show how these side loads are resolved. Done Ok is it in the test plan?

↓
had rationale that positive
maneuvering is critical on beam
doesn't demonstrate attach, will test

again 100 lb Frame test vs. 3-Bike Rack test

split to
added 2 sections ✓

Figure 5.6.2

Please show Aft Beam Limit/Ult Wt.s. 121 lbs Ult? Done

Figure 5.6.2 Sum of the moments about G					
Item	Ult (lbs)	BL (in)	Arm (in) BL - 15.75	Moments (in-lbs)	(lbs)
3. OutBrd Bike	263	66.0	50.25	13216	
2. Bike	210	58.0	42.25	8873	
1. Bike	210	50.0	34.25	7193	
Rack	266	56.7	40.95	10893	
Beam	121	0.0	-15.75	-1906	
Sums	1070		Hz =	38268 / 31.5" =	1215
					1070
			Gz =		2285

Hz's agree. Applied loads agree. Why the 71 lbs difference wrt Gz?

Combining calc used full man load, not proportion to aft
75 lb different
fixed

Figure 5.6.3

Rack Attachment Reactions

Figure 5.6.3 Drag Loads, Rack Attachment Reactions					
Item	Ult (lbs)	BL (in)	Arm (in) BL - 43.9	Moments (in-lbs)	(lbs)
3. OutBrd Bike	159	66.0	22.1	3514	
2. Bike	137	58.0	14.1	1932	
1. Bike	137	50.0	6.1	836	
Rack	163	56.7	12.8	2086	
Sums	596		Ax & Ex =	8368 / 96" =	87

All good.

Helicopter Reactions

What about the beam drag loads? Done

Figure 5.6.6, Reactions okay for loads shown.

i.e.; load changes pending wrt beam drag loads Done

Page 24 Bolts

Su = 60% Ftu is typical for most metals see attached MMPDS-1 Low Alloy spec sheet Su/Ftu = 75/125 = 60%. was thinking 60, bunch of ref. say 75

AN5 Bolt @ 125 ksi & .312 dia is very close (on the slightly conservative side)
Tensile = 6500 Lbs (thru threads) Single Shear = 5750 Lbs (thru full diameter).

See Bruhn Fig. D1.4 for MS calc → Combined tension + shear → tension neglig. noted.

The margin of safety comments.

Are you sure and what are the magnitudes? Do you have any V-g charts?

i.e.; Very rare is not valid. Max climb at less than 100 kts. etc.

MS = 1 is good. Just omit these comments. Done.

We are testing with these M8 fasteners?

AN5 more readily available,
need 23 mm long to fit jig

Wings Engineering Limited
Review Notes
For
Aero Design Ltd.
Engineering Report; ER1002.05-0-12Jul2015
ER1002.05_0_2015-09-14.pdf [Jim, 21 Sept 2015]
[Aero Design to review ER1002.01 wrt to these comments
and update TR1002.06 accordingly.]
Airbus Helicopters EC130B4
Quick Release Bike Rack, Compliance Report

Cover Page

Reads "EC130 B4" vs. CP1002 "AS350 & AS355 All Models" and "EC130 B4"
i.e.; **Change to match CP. Report only applies to EC130 B4** **Ok** ✓

2.0 Reference Text

ER1009.01, Revision 0, dated XX **has not been approved yes by DAR 304** **Fixed** **Ok** ✓

TR1009.02, Revision 0, dated XX **DAR review pending** **Fixed** **Ok** ✓

Aero Design Ltd. Installation Drawings:

~~Need copies of (same list as noted for the ER1002.05 Review)~~

~~100201, Revision 0—Bicycle Rack Installation~~

Changed to read 100202 Rev 0. Have this dwg and the other dwgs noted. ✓

Aero Design Ltd. Fabrication Drawings:

~~Need copies of (same list as noted for the ER1002.05 Review)~~

~~100211, Revision 0 – Bike Rack Assembly~~ **Have** ✓

I have 100201_0_2015-09-09.pdf AS350/355 QR Bike Rack Install (Low) 1 of 4 with 3 blank sheets. Can I please get the missing sheets? *Reprinted*

100215 is the AS350/355 Rack Assy.. Should read 100216? *corrected*

Review wrt self-locking fasteners [Comments]

100216-01-01/2 Rack Base Fab includes;

➤ **Welded-in 100226-01 Bushings that include self-locking helicoils [Ok. Why not just drill thru and use thru bolts wrt this assembly?]** *Not enough room to insert bolt in center*

➤ **Welded-in 100231-01 Fwd Bracket also include self-locking helicoils [Ok.]**

100230-01 Attachment Brackets include self-locking helicoils [Ok.]

Please confirm that all tapped aluminum parts are fitted with self-locking helicoils.

~~100235, Revision 0—Attachment Bracket Fabrication~~ **Removed** ✓ *yes.*

Drawing list updated, attached See comments above.

4.1 Load Factors

Not at bottom of page. Should read "**Racks**"? **Done** **Ok** ✓

4.2 Loads Overview

Please note 2 - 40 lb Bikes and 1 - 50 lb Bike Outbrd **Done** **Ok** ✓

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FMS1002.91

AIRBUS HELICOPTERS (EUROCOPTER) AS350 & AS355 SERIES

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE BICYCLE RACK MODEL 100201

TCCA Supplemental Type Certificate No. _____
FAA Supplemental Type Certificate No. _____
EASA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory. Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Airbus Helicopters (Eurocopter) EC130 B4 Helicopter when fitted with the Quick Release Cargo Basket Installation and/or Quick Release Cabin Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement refer to the Approved Flight Manual and other approved Flight Manual Supplements.

DRAFT

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Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	28 Sept 2015	None		

I LIMITATIONS

1. The maximum load on the Aero Design Ltd. Quick Release Bicycle Rack, model 100201, is 150 lb. (68 kg) total, 50 lbs (22.7 kg) maximum per bicycle.
2. The Aero Design Quick Release Bicycle Rack may be installed on the left side, the right side or both sides.
3. Flight operations limited to VFR conditions with Aero Design Ltd. Quick Release Bicycle Rack installed.
4. V_{NE} is unchanged from the basic rotorcraft when the rack(s) is empty.
 V_{NE} is 110 KIAS with the rack(s) loaded, unless the basic flight manual limitations are more restrictive.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all bikes loaded on the rack are properly secured for flight, including any auxiliary equipment installed on the bikes.
 - b) Ensure the bikes are locked in position on the rack. Pull forward and side to side on the bike to check.
 - b) Ensure the rack is locked in position on the mounting beams. Pull up on the forward end of the rack to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the rack.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

One Bicycle Rack Installed (Left or Right Side):

To be determined

Two Bicycle Racks Installed:

To be determined

V WEIGHT AND BALANCE

This section contains weight and balance and loading information for bicycle rack model 100201.

The racks are limited to 150 lbs (68 kg) per side, 50 lbs (22.7 kg) per bicycle. Heavier bicycles should be located on the inboard positions if possible.

Longitudinal moment arms for bicycles are given only for the location of a bicycle with 26 inch (660 mm) tires. Larger bicycles with larger wheels will shift the CG forward. Due to the length and position of the rack, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

1. Bicycles Loaded on Rack

There are three possible configurations of mounting provisions. All three locate the rack at the same position longitudinally, but each is different laterally. Ensure the correct mounting configuration is used to determine weight and balance.

Standard Units										
Side	Description	Weight	Longitudinal		Lateral (Low Mounted 100201-01)		Lateral (High Mounted 100201-02)		Lateral (Cargo Pod Compatible 100201-03)	
			arm	moment	arm	moment	arm	moment	arm	moment
		lb	in	in-lb	in	in-lb	in	in-lb	in	in-lb
Left	Bike – inboard	50.0	161.00	8050.00	-45.80	-2290.0	-45.00	-2250.0	-47.80	-2390.0
	Bike – center	50.0	161.00	8050.00	-53.80	-2690.0	-53.00	-2650.0	-55.80	-2790.0
	Bike – outboard	50.0	161.00	8050.00	-61.80	-3090.0	-61.00	-3050.0	-63.80	-3190.0
Right	Bike – inboard	50.0	161.00	8050.00	45.80	2290.0	47.8	2250.0	47.80	2390.0
	Bike – center	50.0	161.00	8050.00	53.80	2690.0	55.8	2650.0	55.80	2790.0
	Bike – outboard	50.0	161.00	8050.00	61.80	3090.0	63.8	3050.0	63.80	3190.0

Metric Units										
Side	Description	Weight	Longitudinal		Lateral (Low Mounted 100201-01)		Lateral (High Mounted 100201-02)		Lateral (Cargo Pod Compatible 100201-03)	
			arm	moment	arm	moment	arm	moment	arm	moment
		kg	mm	mm-kg	mm	mm-kg	mm	mm-kg	mm	mm-kg
Left	Bike – inboard	22.7	4089.4	92746.1	-1162.1	-26354.9	-1143.0	-25922.8	-1214.1	-27535.8
	Bike – center	22.7	4089.4	92746.1	-1365.3	-30963.4	-1346.2	-30531.3	-1417.3	-32144.3
	Bike – outboard	22.7	4089.4	92746.1	-1568.5	-35571.9	-1549.4	-25139.8	-1620.5	-36752.8
Right	Bike – inboard	22.7	4089.4	92746.1	1162.5	26354.9	1143.0	25922.8	-1214.1	27535.8
	Bike – center	22.7	4089.4	92746.1	1365.3	30963.4	1346.2	30531.3	-1417.3	32144.3
	Bike – outboard	22.7	4089.4	92746.1	1568.5	35571.9	1549.4	25139.8	-1620.5	36752.8

2. Configuration 100201-01 – Bicycle Rack on Low Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-01-02	LH Low Mounting Provisions Installation	6.4	135.60	867.5	-37.20	-238.0
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.7	-53.30	-3102.1
100201-01-01	LH Low Bicycle Rack Installation (total)	64.6	145.30	9386.2	-51.70	-3340.1
78602-01-01	RH Low Mounting Provisions Installation	6.4	135.60	867.5	37.20	238.0
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.7	53.30	3102.1
100201-01-02	RH Low Bicycle Rack Installation (total)	64.6	145.30	9386.2	51.70	3340.1

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78602-01-02	LH Low Mounting Provisions Installation	2.9	3443.0	9970.6	944.6	2735.40
100210-01	LH Bicycle Rack Assembly	26.4	3717.8	98146.6	1353.8	35739.64
100201-01-01	LH Low Bicycle Rack Installation (total)	29.3	3690.1	108117.2	1313.2	38475.04
78602-01-01	RH Low Mounting Provisions Installation	2.9	3443.0	9970.6	944.6	2735.40
100210-01	RH Bicycle Rack Assembly	26.4	3717.8	98146.6	1353.8	35739.64
100201-01-02	RH Low Bicycle Rack Installation (total)	29.3	3690.1	108117.2	1313.2	38475.04

3. Configuration 100201-02 – Bicycle Rack on High Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-02-02	LH High Mounting Provisions Installation	6.4	135.60	867.50	-36.50	-233.80
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.73	-52.53	-3057.25
100201-02-01	LH High Bicycle Rack Installation (total)	64.6	145.30	9386.23	-50.94	-3291.05
78602-02-01	RH High Mounting Provisions Installation	6.4	135.60	867.50	36.50	233.80
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.73	52.53	3057.25
100201-02-02	RH High Bicycle Rack Installation (total)	64.6	145.30	9386.23	50.94	3291.05

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78602-02-02	LH High Mounting Provisions Installation	2.9	3443.0	9970.6	-928.1	-2687.6
100210-01	LH Bicycle Rack Assembly	26.4	3717.8	98146.6	-1334.3	-35223.3
100201-02-01	LH High Bicycle Rack Installation (total)	29.3	3690.1	108117.2	-1293.9	-37910.9
78602-02-01	RH High Mounting Provisions Installation	2.9	3443.0	9970.6	928.1	2687.6
100210-01	RH Bicycle Rack Assembly	26.4	3717.8	98146.6	1334.3	35223.3
100201-02-02	RH High Bicycle Rack Installation (total)	29.3	3690.1	108117.2	1293.9	37910.9

4. Configuration 100201-01 – Bicycle Rack on Cargo Pod Compatible Mounting Provisions

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78603-01-02	LH Cargo Pod Compatible Mounting Provisions Installation	6.8	135.40	921.00	-38.80	263.60
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.73	-55.30	3218.46
100201-03-01	LH Cargo Pod Compatible Bicycle Rack Installation (total)	65.0	145.23	9439.73	-53.57	3482.06
78603-01-01	RH Cargo Pod Compatible Mounting Provisions Installation	6.8	135.40	921.00	38.80	263.60
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.73	55.30	3218.46
100201-03-02	RH Cargo Pod Compatible Bicycle Rack Installation (total)	65.0	145.23	9439.73	53.57	3482.06

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
78603-01-02	LH Cargo Pod Compatible Mounting Provisions Installation	3.1	3440.1	10584.8	-984.6	-3029.6
100210-01	LH Bicycle Rack Assembly	26.4	3717.8	98146.6	-1404.6	-37080.7
100201-03-01	LH Cargo Pod Compatible Bicycle Rack Installation (total)	29.5	3685.9	108731.4	-1359.7	-40110.3
78603-01-01	RH Cargo Pod Compatible Mounting Provisions Installation	3.1	3440.1	10584.8	984.6	3029.6
100210-01	RH Bicycle Rack Assembly	26.4	3717.8	98146.6	1404.6	37080.7
100201-03-02	RH Cargo Pod Compatible Bicycle Rack Installation (total)	29.5	3685.9	108731.4	1359.7	40110.3

VI INSTALLATION / REMOVAL INSTRUCTIONS

1. Bicycles on Rack

The racks are designed to accommodate bicycles with 26 – 29 inch (660 – 740 mm) tires, up to 4 inches (100 mm) wide, with sufficient clearance for brakes and suspension components.

The bicycles are retained by a moveable frame with a cam mechanism that locks down on the tires. The mechanism also locks the frame in position when the rack is not loaded.

CAUTION:

Deflated tires may not be gripped sufficiently to be safely retained in flight. Ensure the wheel rim is adequately gripped to prevent shifting. Additional blocking and/or straps may be required.

To provide maximum clearance from the helicopter, the most inboard bicycle shall be loaded with the handle bars aft. It is recommended to load the centre bicycle with the handle bars forward, and the outboard bicycle with the handle bars aft, however orientation of these bicycles is not mandatory and they shall be loaded as required to allow clearance between the pedals, gears, suspension and other components.

CAUTION:

Some loading combinations may require adapting the bicycle to fit, such as changing the height of or removing the seat or rotating the handle bars. Ensure all components are secured prior to flight.

A. Loading - Refer to Figure 1.

1. Set bicycle on rack. Slide bicycle aft forcefully to seat tire in aft fixed frame.
2. Slide moving frame aft forcefully to seat frame against tire. Push on lower part of frame for easiest movement.
3. Rotate lever on cam mechanism up to clamp frame into bicycle. Lever will snap into locked position.
4. Check bicycle is tightly retained by pulling side to side.

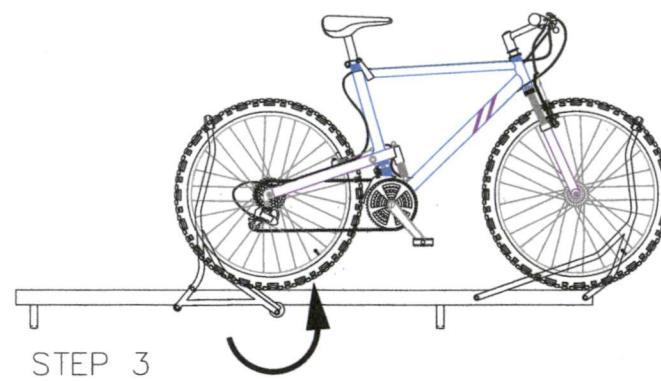
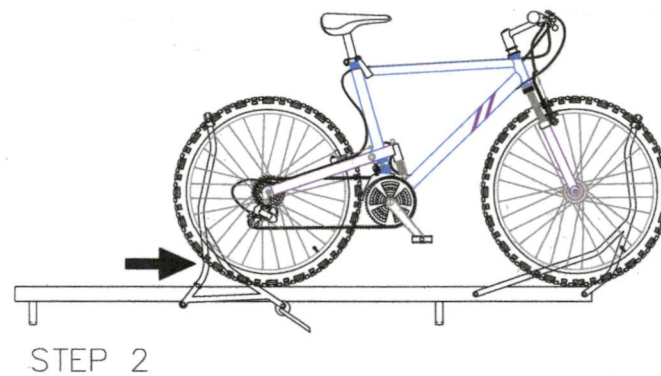
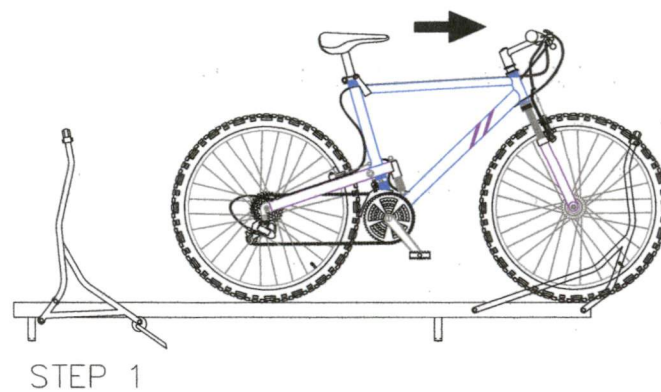


Figure 1 – Bicycle loading
(unloading is reverse)

B. Unloading - Refer to Figure 1.

1. Unlock cam on forward moving frame by rotating lever down to open position.
2. Slide moving frame forward. Pull on lower part of frame for easiest movement.
3. Pull bicycle forward to unseat from aft frame. Remove bicycle.

2. Bicycle Rack Assembly

The mounting beams are installed in accordance with drawing 78602 or 78603. The bicycle rack(s) is installed in accordance with drawing 100201. Logbook entry indicating installation or removal of bicycle rack and which weight and balance amendment is in effect is required when a bicycle rack is installed or removed.

A. Installation - Refer to Figure 2.

1. At aft mounting beam, slide rack attachment fittings into keyways on mounting beam.
2. At forward mounting beam, slide rack aft and lift rack until attachment fitting hits stop over keyway. Push fittings into keyways and slide rack down until locked.

B. Removal - Refer to Figure 2.

1. Pull knob at bottom end of forward beam and lift forward end of rack until attachment fittings are free of keyways.
2. Slide rack forward until aft attachment fittings are free of keyways and remove from helicopter.

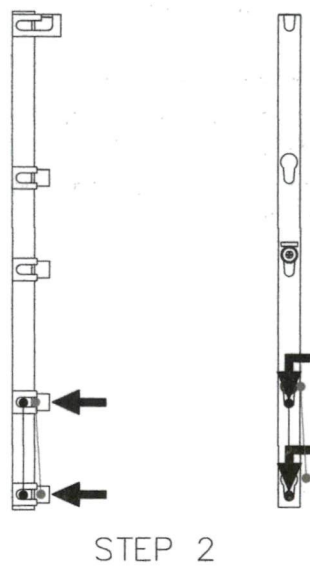
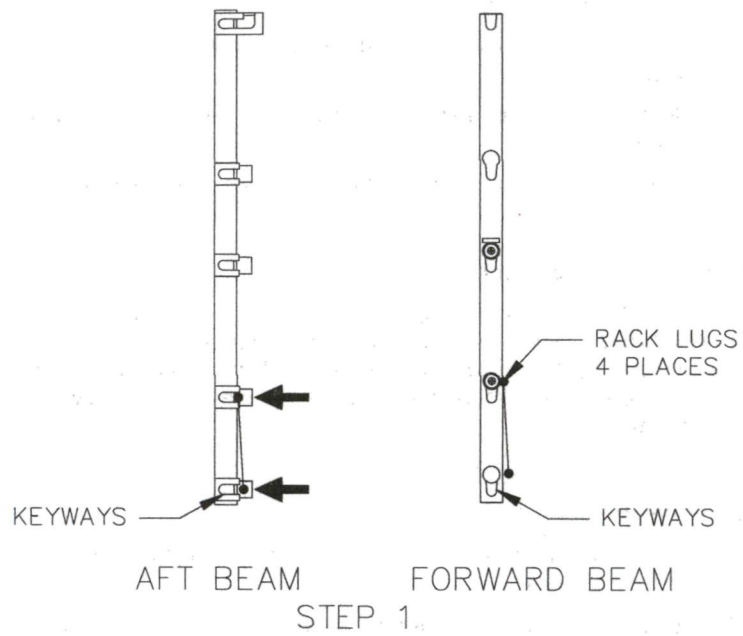


Figure 2 – Rack Attachment Steps

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FMS1002.92

AIRBUS HELICOPTERS (EUROCOPTER) EC130 B4

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE BICYCLE RACK MODEL 100202

TCCA Supplemental Type Certificate No. SH08-16
FAA Supplemental Type Certificate No. SR02680NY
EASA Supplemental Type Certificate No. _____

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Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	28 Sept 2015	None		

I LIMITATIONS

1. The maximum load on the Aero Design Ltd. Quick Release Bicycle Rack, model 100202, is 130 lb. (136 kg) total, 50 lbs maximum per bicycle.
2. The Aero Design Quick Release Bicycle Rack may be installed on the left side, the right side or both sides.
3. The Aero Design Quick Release Cabin Step must be installed on the mounting provisions unless a Quick Release Bicycle Rack or other equipment is installed. Refer to FMS1009.91.
3. Flight operations limited to VFR conditions with Aero Design Ltd. Quick Release Bicycle Rack installed.
4. V_{NE} is unchanged from the basic rotorcraft when the rack(s) is empty.
 V_{NE} is 110 KIAS with the rack(s) loaded, unless the basic flight manual limitations are more restrictive.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all bikes loaded on the rack are properly secured for flight, including any auxiliary equipment installed on the bike.
 - b) Ensure the bikes are locked in position on the rack. Pull forward and side to side on the bike to check.
 - b) Ensure the rack is locked in position on the mounting beams. Pull up on the forward end of the rack to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the rack.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

One Bicycle Rack Installed (Left or Right Side):

To be determined

Two Bicycle Racks Installed:

To be determined

V WEIGHT AND BALANCE

This section contains weight and balance and loading information for bicycle rack model 100202.

The racks are limited to 130 lbs (59 kg) per side, 50 lbs (22.7 kg) per bicycle. Heavier bicycles should be located on the inboard positions if possible.

Longitudinal moment arms for bicycles are given only for the location of a bicycle with 26 inch (660 mm) tires. Larger bicycles with larger wheels will shift the CG forward. Due to the length and position of the rack, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

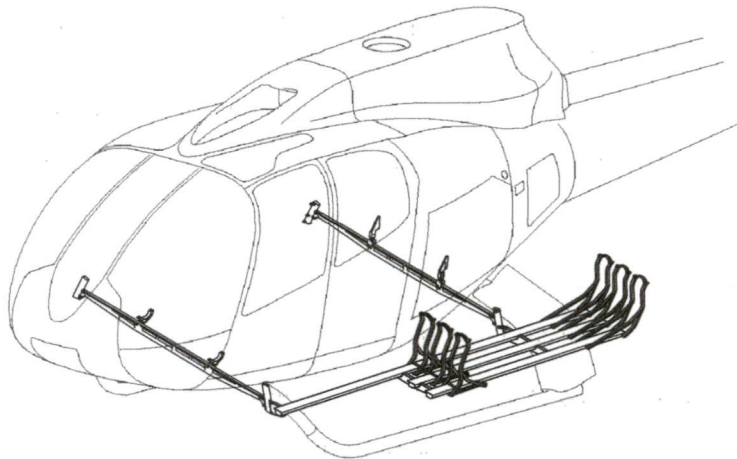
1. Bicycles Installed on Rack, Configuration 100202

Standard Units						
Side	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
Left	Bike – inboard	50.0	148.90	7445.00	-50.00	-2500.00
	Bike – center	40.0	148.90	5956.00	-58.00	-2320.00
	Bike – outboard	40.0	148.90	5956.00	-66.00	-2640.00
Right	Bike – inboard	50.0	148.90	7445.00	50.00	2500.00
	Bike – center	40.0	148.90	5956.00	58.00	2320.00
	Bike – outboard	40.0	148.90	5956.00	66.00	2640.00

Metric Units						
P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
Left	Bike – inboard	50.0	148.90	7445.00	-50.00	-2500.00
	Bike – center	40.0	148.90	5956.00	-58.00	-2320.00
	Bike – outboard	40.0	148.90	5956.00	-66.00	-2640.00
Right	Bike – inboard	50.0	148.90	7445.00	50.00	2500.00
	Bike – center	40.0	148.90	5956.00	58.00	2320.00
	Bike – outboard	40.0	148.90	5956.00	66.00	2640.00

2. Configuration 100202 – Bicycle Rack and Mounting Provisions

The following weight and balance is for the bicycle rack and mounting provisions installed in accordance with drawing 100202.



Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
100902-01	Mounting Provisions Installation	46.0	102.21	4699.53	0.00	0.00
100210-01	LH Bicycle Rack Assembly	65.0	100.90	6558.50	-56.70	-3685.50
100201- 01-01	LH Bicycle Rack Installation (total)	111.0	101.44	11258.0	-33.21	-3685.50
100910-01	RH Bicycle Rack Assembly	65.0	100.90	6558.50	56.70	3685.50
100901- 01-02	RH Bicycle Rack Installation (total)	111.0	101.44	11258.0	33.21	3685.50
100910-01	LH Bicycle Rack Assembly	65.0	100.90	6558.50	-56.70	-3685.50
100910-01	RH Bicycle Rack Assembly	75.0	100.90	7567.50	56.90	4267.50
100901- 01-01 / -02	Dual Bicycle Rack Installation (total)	176.0	101.24	17816.5	0.00	0.00

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
100902-01	Mounting Provisions Installation	19.5	2591.21	50540.31	0.00	0.00
100210-01	LH Bicycle Rack Assembly	29.5	2562.86	75562.18	-1440.18	-42461.60
100201-01-01	LH Bicycle Rack Installation (total)	49.0	2574.15	126102.5	-866.78	-42461.6
100910-01	RH Bicycle Rack Assembly	29.5	2562.86	75562.18	1440.18	42461.60
100901-01-02	RH Bicycle Rack Installation (total)	49.0	2574.15	126102.5	866.78	42461.6
100910-01	LH Bicycle Rack Assembly	29.5	2562.86	75562.18	-1440.18	-42461.60
100910-01	RH Bicycle Rack Assembly	29.5	2562.86	75562.18	1440.18	42461.60
100901-01-01 / -02	Dual Bicycle Rack Installation (total)	78.5	2569.91	201664.7	0.00	0.0

VI INSTALLATION / REMOVAL INSTRUCTIONS

1. Bicycles on Rack

The racks are designed to accommodate bicycles with 26 – 29 inch (660 – 740 mm) tires, up to 4 inches (100 mm) wide, with sufficient clearance for brakes and suspension components.

The bicycles are retained by a moveable frame with a cam mechanism that locks down on the tires. The mechanism also locks the frame in position when the rack is not loaded.

CAUTION:

Deflated tires may not be gripped sufficiently to be safely retained in flight. Ensure the wheel rim is adequately gripped to prevent shifting. Additional blocking and/or straps may be required.

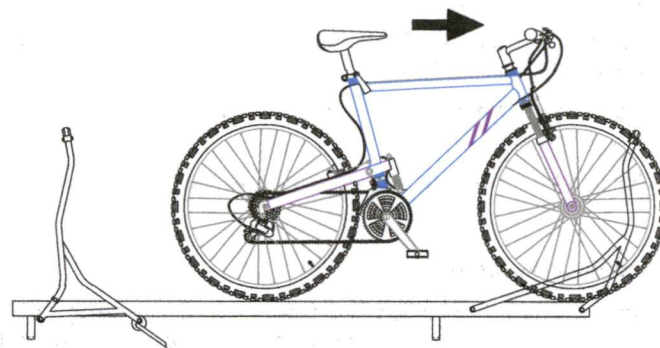
To provide maximum clearance from the helicopter, the most inboard bicycle shall be loaded with the handle bars aft. It is recommended to load the centre bicycle with the handle bars forward, and the outboard bicycle with the handle bars aft, however orientation of these bicycles is not mandatory and they shall be loaded as required to allow clearance between the pedals, gears, suspension and other components.

CAUTION:

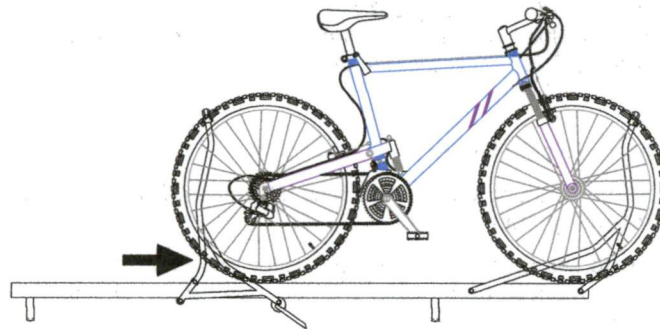
Some loading combinations may require adapting the bicycle to fit, such as changing the height of or removing the seat or rotating the handle bars. Ensure all components are secured prior to flight.

A. Loading - Refer to Figure 1.

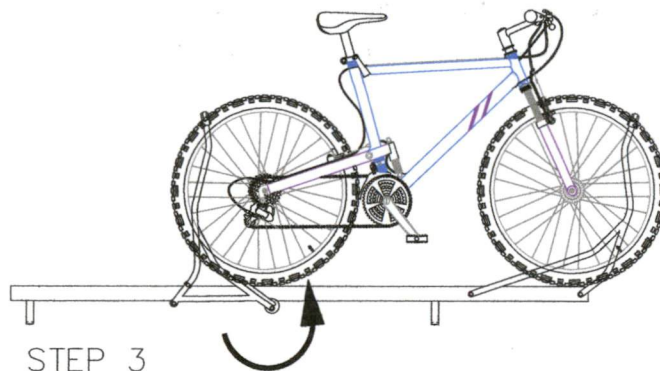
1. Set bicycle on rack. Slide bicycle aft forcefully to seat tire in aft fixed frame.
2. Slide moving frame aft forcefully to seat frame against tire. Push on lower part of frame for easiest movement.
3. Rotate lever on cam mechanism up to clamp frame into bicycle. Lever will snap into locked position.
4. Check bicycle is tightly retained by pulling side to side.



STEP 1



STEP 2



STEP 3

Figure 1 – Bicycle loading
(unloading is reverse)

B. Unloading - Refer to Figure 1.

1. Unlock cam on forward moving frame by rotating lever down to open position.
2. Slide moving frame forward. Pull on lower part of frame for easiest movement.
3. Pull bicycle forward to unseat from aft frame. Remove bicycle.

2. Bicycle Rack Assembly

The mounting beams are installed in accordance with drawing 100902 and 100903. The bicycle rack(s) is installed in accordance with drawing 100202. The cabin step is installed in accordance with drawing 101001. Removal of the bicycle rack requires installation of the cabin step, refer to Flight Manual Supplement FMS1009.91. Logbook entry indicating installation or removal of bicycle rack and which weight and balance amendment is in effect is required when a bicycle rack is installed or removed.

A. Installation - Refer to Figure 2.

1. At aft mounting beam, slide rack attachment fittings into keyways on mounting beam.
2. At forward mounting beam, slide rack aft and lift rack until attachment fitting hits stop over keyway. Push fittings into keyways and slide rack down until locked.

B. Removal - Refer to Figure 2.

1. Pull knob at bottom end of forward beam and lift forward end of rack until attachment fittings are free of keyways.
2. Slide rack forward until aft attachment fittings are free of keyways and remove from helicopter.

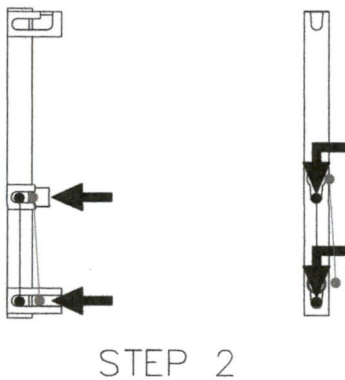
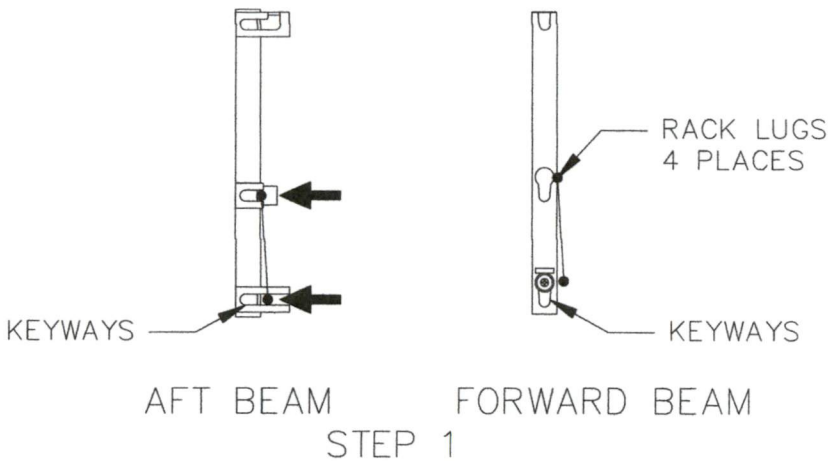


Figure 2 – Rack Attachment Steps

Aero Design Ltd.



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FMS1009.91

AIRBUS HELICOPTERS (EUROCOPTER) EC130 B4

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE CARGO BASKET

CARGO BASKET MODELS: 100901

TCCA Supplemental Type Certificate No. SH08-16
FAA Supplemental Type Certificate No. SR02680NY
EASA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory. Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Airbus Helicopters (Eurocopter) EC130 B4 Helicopter when fitted with the Quick Release Cargo Basket Installation and/or Quick Release Cabin Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement refer to the Approved Flight Manual and other approved Flight Manual Supplements.

DRAFT

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II	Normal Procedures	3
III	Emergency Procedures	3
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V	Weight and Balance	5
VI	Installation / removal instructions	10

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	28 Sept 2015	None		

I LIMITATIONS

1. The maximum load in the Aero Design Ltd. Quick Release Cargo Basket, model 1009, is 300 lb. (136 kg).
2. The Aero Design Quick Release Cargo Basket may be installed on the left side, the right side or both sides.
3. The Aero Design Quick Release Cabin Step must be installed on both sides of the mounting provisions unless a Quick Release Cargo Basket or other equipment is installed.
3. Flight operations limited to VFR conditions with Aero Design Ltd. Quick Release Cargo Basket installed.
4. V_{NE} is unchanged from the basic rotorcraft.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

One Cargo Basket Installed (Left or Right Side):

1. Cruise performance and range will be reduced by approximately 10 percent. (to be confirmed – AS350 value)
2. Climb performance will be reduced by up to 150 fpm. (to be confirmed – AS350 value)

Two Cargo Baskets Installed:

1. Cruise performance and range will be reduced by approximately 20 percent. (to be confirmed – AS350 value)
2. Climb performance will be reduced by up to 300 fpm. (to be confirmed – AS350 value)

V WEIGHT AND BALANCE

This section contains weight and balance information for cargo basket models 100901 and cabin step model 101001.

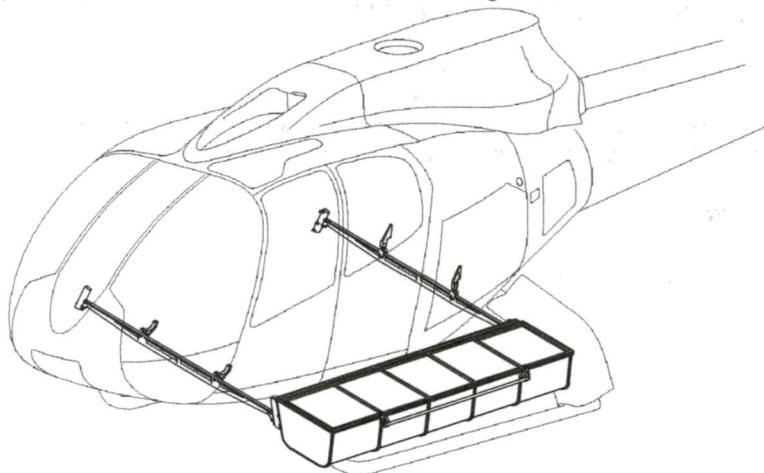
Longitudinal and Lateral moment arms for Cargo are given only for the center of the Cargo Basket. Due to the length and position of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

1. Configuration 100901 – Cargo Basket and Mounting Provisions

The following weight and balance is for the cargo basket and mounting provisions installed in accordance with drawing 100901.



Standard Units

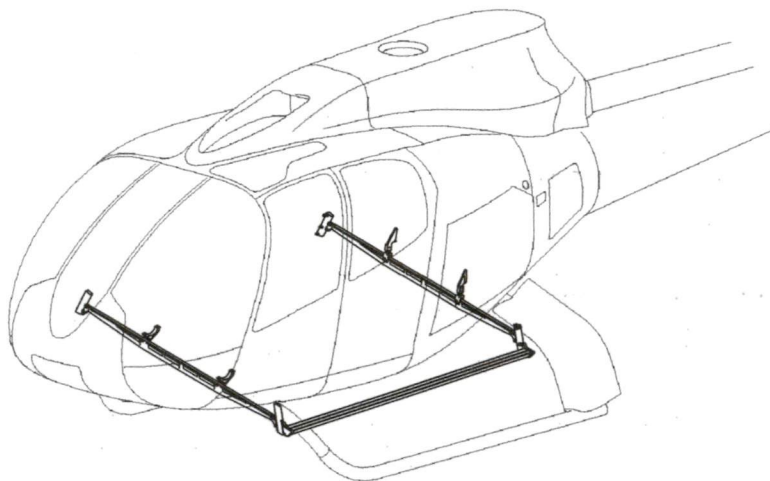
P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
100902-01	Mounting Provisions Installation	46.0	102.21	4699.53	0.00	0.00
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	-56.90	-4267.50
100901-01-01	LH Cargo Basket Installation (total)	121.0	101.40	12267.03	-35.27	-4267.50
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	56.90	4267.50
100901-01-02	RH Cargo Basket Installation (total)	121.0	101.40	12267.03	35.27	4267.50
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	-56.90	-4267.50
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	56.90	4267.50
100901-01-01 / -02	Dual Cargo Basket Installation (total)	196.0	101.21	19834.53	0.00	0.00
	Cargo (max, LH)	300.0	100.90	30270.00	-56.90	-17070.00
	Cargo (max, RH)	300.0	100.90	30270.00	56.90	17070.00

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
100902-01	Mounting Provisions Installation	19.5	2591.21	50540.31	0.00	0.00
100910-01	Cargo Basket Assembly	34.0	2562.86	87187.13	-1445.26	-49166.98
100901-01-01	LH Cargo Basket Installation (total)	53.5	2573.19	137727.45	-918.60	-49166.98
100910-01	Cargo Basket Assembly	34.0	2562.86	87187.13	1445.26	49166.98
100901-01-02	RH Cargo Basket Installation (total)	53.5	2573.19	137727.45	918.60	49166.98
100910-01	Cargo Basket Assembly	34.0	2562.86	87187.13	-1445.26	-49166.98
100910-01	Cargo Basket Assembly	34.0	2562.86	87187.13	1445.26	49166.98
100901-01-01/-02	Dual Cargo Basket Installation (total)	87.5	2569.18	224914.58	0.00	0.00
	Cargo (max, LH)	136.0	2562.86	348548.96	-1445.26	-196555.36
	Cargo (max, RH)	136.0	2562.86	348548.96	1445.26	196555.36

2. Configuration 101001 – Cabin Step and Mounting Provisions

The following weight and balance is for the cargo basket and mounting provisions installed in accordance with drawing 100901.



Standard Units						
		Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Part #	Name					
Step Installation						
100902-01	Provisions Installation	46.0	102.21	4699.53	0.00	0.00
101010-01	Step Assembly	7.2	100.90	726.48	-47.00	-338.40
101001-01-01	LH Step Installation (Total)	53.2	102.03	5426.01	-6.36	-338.40
100902-01	Provisions Installation	46.0	102.21	4699.53	0.00	0.00
101010-01	Step Assembly	7.2	100.90	726.48	47.00	338.40
101001-01-02	RH Step Installation (Total)	53.2	102.03	5426.01	6.36	338.40
100902-01	Provisions Installation	46.0	102.21	4699.53	0.00	0.00
101010-01	Step Assembly	7.2	100.90	726.48	-47.00	-338.40
101010-01	Step Assembly	7.2	100.90	726.48	47.00	338.40
101001-01-01/-02	Dual Step Installation (Total)	60.4	101.90	6152.49	0.00	0.00

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step Installation						
100902-01	Provisions Installation	19.50	2591.21	50540.31	0.00	0.00
101010-01	Step Assembly	3.27	2562.86	8369.96	-1193.80	-3898.79
101001-01-01	LH Step Installation (Total)	22.8	2587.15	58910.3	-171.22	-3898.8
100902-01	Provisions Installation	19.50	2591.21	50540.31	0.00	0.00
101010-01	Step Assembly	3.27	2562.86	8369.96	1193.80	3898.79
101001-01-02	RH Step Installation (Total)	22.8	2587.15	58910.3	171.22	3898.8
100902-01	Provisions Installation	19.50	2591.21	50540.31	0.00	0.00
101010-01	Step Assembly	3.27	2562.86	8369.96	-1193.80	-3898.79
101010-01	Step Assembly	3.27	2562.86	8369.96	1193.80	3898.79
101001-01-01/-02	Dual Step Installation (Total)	26.0	2584.10	67280.2	0.00	0.00

VI INSTALLATION / REMOVAL INSTRUCTIONS

Cargo Baskets and Cabin Steps

The mounting beams are installed in accordance with drawing 100902 and 100903. The basket is installed in accordance with drawing 100901. The cabin step is installed in accordance with drawing 101001. Removal of the basket requires installation of the cabin step. Logbook entry indicating installation or removal of basket or cabin step and which weight and balance amendment is in effect is required when a basket is installed or removed.

1. Installation - Refer to Figure 1.

1. Set basket upper aft attachment into upper keyway in aft beam. Forward end of basket may rest on floor.
2. Raise forward end of basket to forward beam and engage lower aft attachment into keyway on aft beam. Slide basket aft, and lift basket until lower attachment fitting hits stop over keyway in forward beam.
3. Push fitting into lower keyway, ensure top fitting enters top keyway, and slide basket down until locked. Pull up on forward end basket to ensure basket is locked in place.

2. Removal - Refer to Figure 1.

1. Pull knob at bottom end of forward beam and lift basket until attachment fittings are free of keyways on forward beam.
2. Lift basket up and pull forward until lower aft attachment fitting is free of keyway. Rest forward end of basket on floor.
3. At aft end, slide basket forward and raise basket until upper aft attachment fitting is free of keyway.

Note: Installation and removal of cabin steps is identical to basket, except using the lower keyways

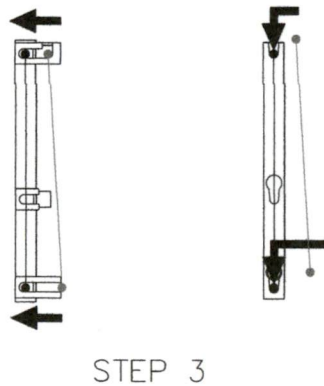
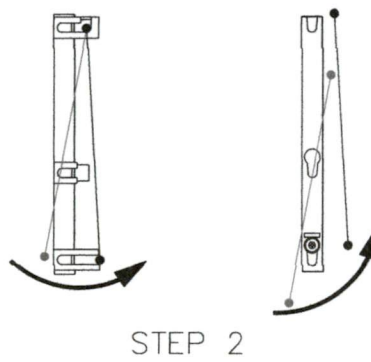
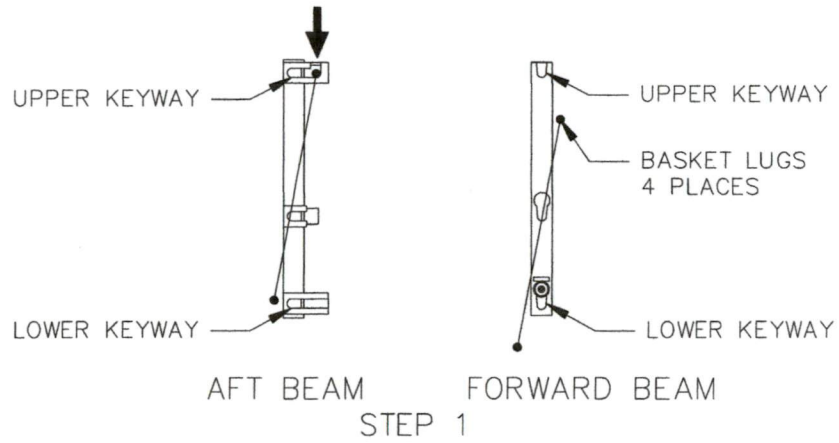


Figure 1 – Basket Attachment Steps
(Installation of cabin steps similar using lower keyways).

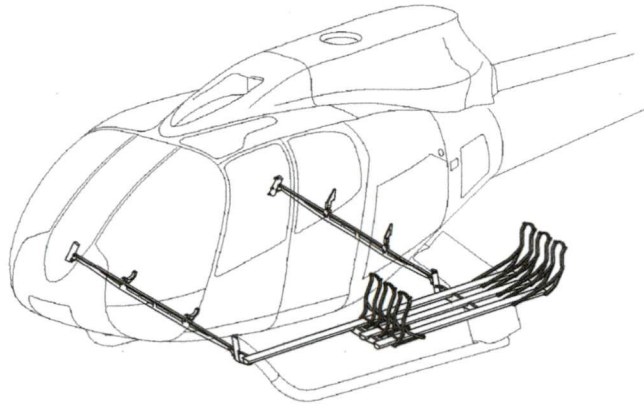
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

ICA 1009.90

1002.20

AIRBUS HELICOPTERS AS350 & AS355, EC130 B4

QUICK RELEASE BICYCLE RACK



TCCA Supplemental Type Certificate No. SH_____

FAA Supplemental Type Certificate No. _____

EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Bicycle Rack is installed in accordance with Aero Design Ltd. Document Control Lists:

- DCL1002-1 (AS350/AS355), Revision 0,
 - DCL1002-2 (EC130 B4), Revision 0,
- or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0

Date: 25 September 2015

Aero Design Ltd.



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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	25 September 2015	N/A	Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue) 25 September 2015

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
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	5	0
04-00-00	6	0
05-00-00	7	0
	8	0
	9	0
	10	0
11-00-00	11	0
25-50-00	12	0
	13	0
	14	0
	15	0
	16	0
	17	0
	18	0

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Bicycle Rack Installation as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

CAUTION : This installation is NOT compatible with fixed or pop-out float installations.

0-5 GENERAL DESCRIPTION

The Quick Release Bicycle Rack is installed on the fixed mounting provisions used for cargo basket installations. The rack consists of a base made of aluminum extrusion welded to support beam, and stainless steel tubing frames attached to the base for securing the bicycles. The quick release bike rack allows for the installation and removal of the rack without tools, leaving the mounting beams in place.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Bicycle Rack.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Bicycle Rack.

Refer to the ICA764.90 for the AS350/AS355 Quick Release Cargo Basket for inspection requirements for the mounting provisions.

Refer to the ICA1009.90 for the EC130 Quick Release Cargo Basket for inspection requirements for the mounting provisions.

Daily Inspection

1. Inspection Area: Bicycle Rack

- a) Inspect the bicycle rack attachment to the mounting beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain bicycle rack, replace spring, refer to section 25-9.

300 Hour or Annual Inspection

1. Inspection Area: Bicycle Rack

- a) Visually inspect bicycle rack for damage.
- b) Visually inspect welds on the rack base for cracks, corrosion or other damage.
- c) Visually inspect welds on the wheel frames for cracks, corrosion or other damage.
- d) Visually inspect lugs attaching the basket to the beams for security and damage.
- e) Visually inspect bolts securing wheel frames to rack for condition and security.
- f) Inspect locking cam and rollers on movable wheel frame (forward frame) for condition and operation. Test locking friction by pulling on frame from the top with a spring scale, minimum **XXX** breakout force is required.

Special Inspections

1. Following a hard landing inspect the Quick Release Bicycle Rack installation in accordance with the 300 hour or annual inspection listed above.
2. Any joints using a helical thread insert (Helicoil) shall be inspected on assembly in accordance with the procedure for checking self locking nuts and screws specified in the Eurocopter Standard Practices Manual, Section 20.02.05.601

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

Refer to the ICA764.90 for the AS350/AS355 Quick Release Cargo Basket for damage limits and repair instructions for the mounting provisions.

Refer to the ICA1009.90 for the EC130 Quick Release Cargo Basket for damage limits and repair instructions for the mounting provisions.

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Aluminum Rack Base Assembly

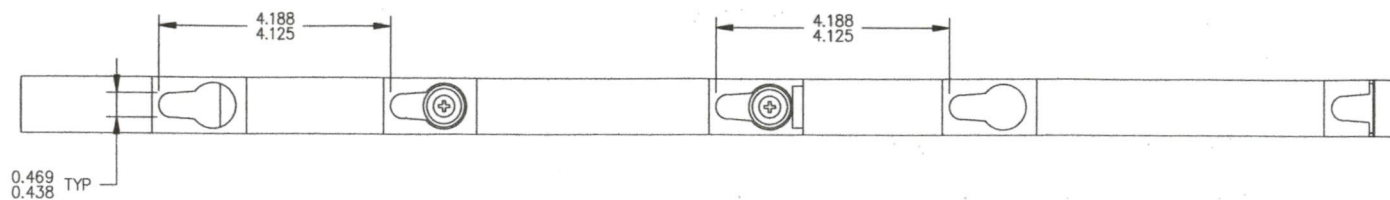
Part	Type of Damage	Max. Allowable	Repair
Support Beams	Corrosion	0.030" deep	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks	0.030" deep x 0.5" long	Blend up to 0.030" deep with scotchbrite.
	Cracks - weld	0.25" max	See item 4.
	Cracks	None	N/A
	Dents	None	N/A
	Bent Lugs	None	N/A
Rail Sections	Corrosion	2" x 2" x 0.030" deep	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks	0.030" deep x 1" long	Blend up to 0.030" deep with scotchbrite.
	Cracks	None	See item 4.
	Dents	None	N/A
	Permanent Deflection of Rail	0.25" max between support beams	None

2. Stainless Steel Wheel Frames

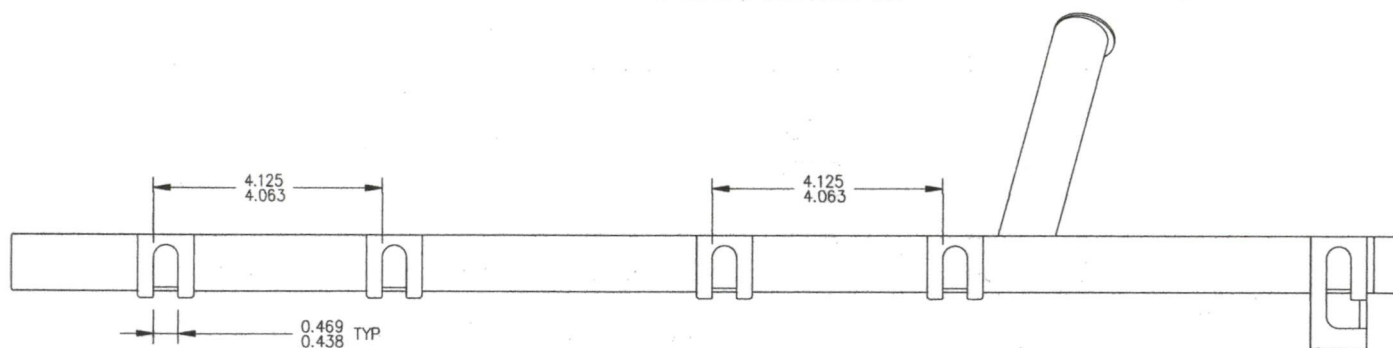
Part	Type of Damage	Max. Allowable	Repair
Wheel Frames	Corrosion	0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 0.125" wide	Blend up to 0.010" deep with scotchbrite.
	Cracks - weld	0.13" max	See item 5.
	Cracks	None	N/A
	Dents	None	N/A
	Elongation of Keyway	See figure 5.1	None
	Widening of slots	See figure 5.1	None

3. Stainless Steel Mounting Beams

Part	Type of Damage	Max. Allowable	Repair
Mounting Beams	Elongation of Keyway	See figure 5.1	None
	Widening of slots	See figure 5.1	None

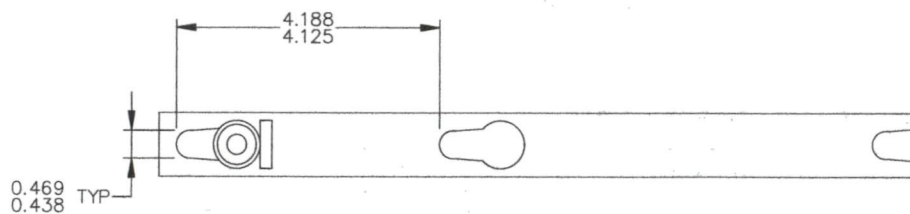


FORWARD BEAM

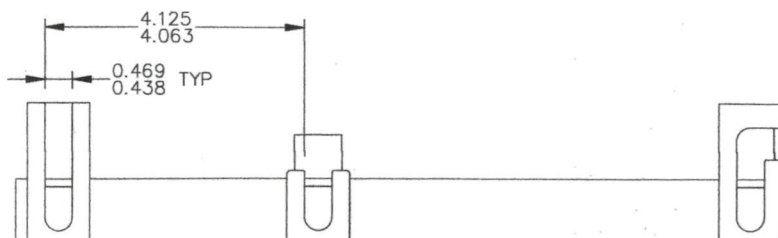


AFT BEAM

Figure 5.1 – Critical Keyway Dimensions (AS350 / AS355)



FORWARD BEAM



AFT BEAM

(LH SHOWN, RH OPPOSITE)

Figure 5.2 – EC130 Critical Keyway dimensions

4. Rack Base Welds

Welds attaching the rails to the support beams must not extend beyond 0.5 - 0.75 inch (13 - 19 mm) below top surface of support beams, the remaining length is not welded. Cracks up to 0.25" long may be repaired as follows:

- a) Clean area of surface finish.
- b) Grind away weld in area of crack.
- c) T.I.G. weld per MIL-STD-2219 Class "C" using ER4043 filler rod. Do not grind flush.
- d) Touch up paint as noted in section 5-3.

5. Wheel Frame Welds

Frames are not welded in tight inside corners where access is limited. Cracks up to 0.13" long may be repaired as follows:

- e) Clean area of surface finish.
- f) Grind away weld in area of crack.
- g) T.I.G. weld per MIL-STD-2219 Class "C" using ER308L filler rod. Do not grind flush.
- h) Touch up surface finish as noted in section 5-3.

6. Helical Thread Inserts

Helical thread inserts (Helicoils) found to be damaged shall be repaired in accordance with the Airbus Helicopters (Eurocopter) Standard Practices Manual, Section 20.03.04.404.

Part numbers:

1/4-28 insert: 3591-4CN375

3/8-24 insert: 3591-6CN563

5-3 PROTECTIVE TREATMENT INFORMATION

1. Bicycle Rack

The base of the rack is supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

Alternate: The base of the rack is supplied painted. If the paint is damaged, touch up with polyurethane paint.

The stainless steel wheel frames are supplied polished (no surface finish).

Alternate: The stainless steel wheel frames are supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

Alternate: The stainless steel wheel frames are supplied painted. If the paint is damaged, touch up with polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation, located on the forward end of the rack base:

- a) Bicycle Rack, Model 100210, AS350 / AS355
S/N 100201-01 and sub. (LH); S/N 100202-01 and sub. (RH)



- b) Bicycle Rack, Model 100211, EC130
S/N 100211-01 and sub. (LH); S/N 100212-01 and sub. (RH)



LH shown, RH opposite

CHAPTER 25 – EQUIPMENT AND FURNISHINGS**SECTION 50 – CARGO COMPARTMENTS****25-1 BICYCLE RACK REMOVAL**

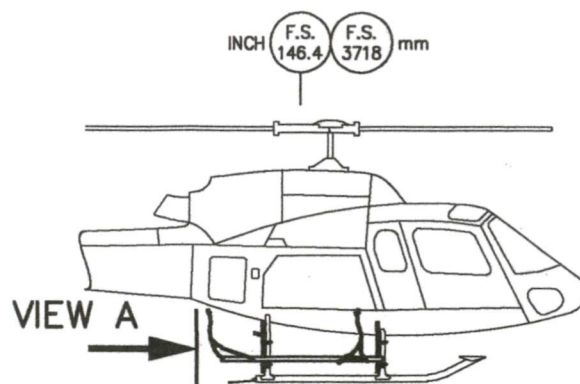
Refer to Figure 25.5 and Figure 25.6.

1. Pull knob at bottom end of forward beam and lift basket until attachment fittings are free of keyways on forward beam.
2. Lift basket up and pull forward until lower aft attachment fitting is free of keyway. Rest forward end of basket on floor.
3. At aft end, slide basket forward and raise basket until upper aft attachment fitting is free of keyway.

25-2 BICYCLE RACK INSTALLATION

Refer to Figure 25.5 and Figure 25.6.

1. Set basket upper aft attachment into upper keyway in aft beam. Forward end of basket may rest on floor.
2. Raise forward end of basket to forward beam and engage lower aft attachment into keyway on aft beam. Slide basket aft, and lift basket until lower attachment fitting hits stop over keyway in forward beam.
3. Push fitting into lower keyway, ensure top fitting enters top keyway, and slide basket down until locked. Pull up on forward end basket to ensure basket is locked in place.



- ② BICYCLE RACK INSTALLATION – LOW RH
SHOWN
- ① BICYCLE RACK INSTALLATION – LOW LH
OPPOSITE

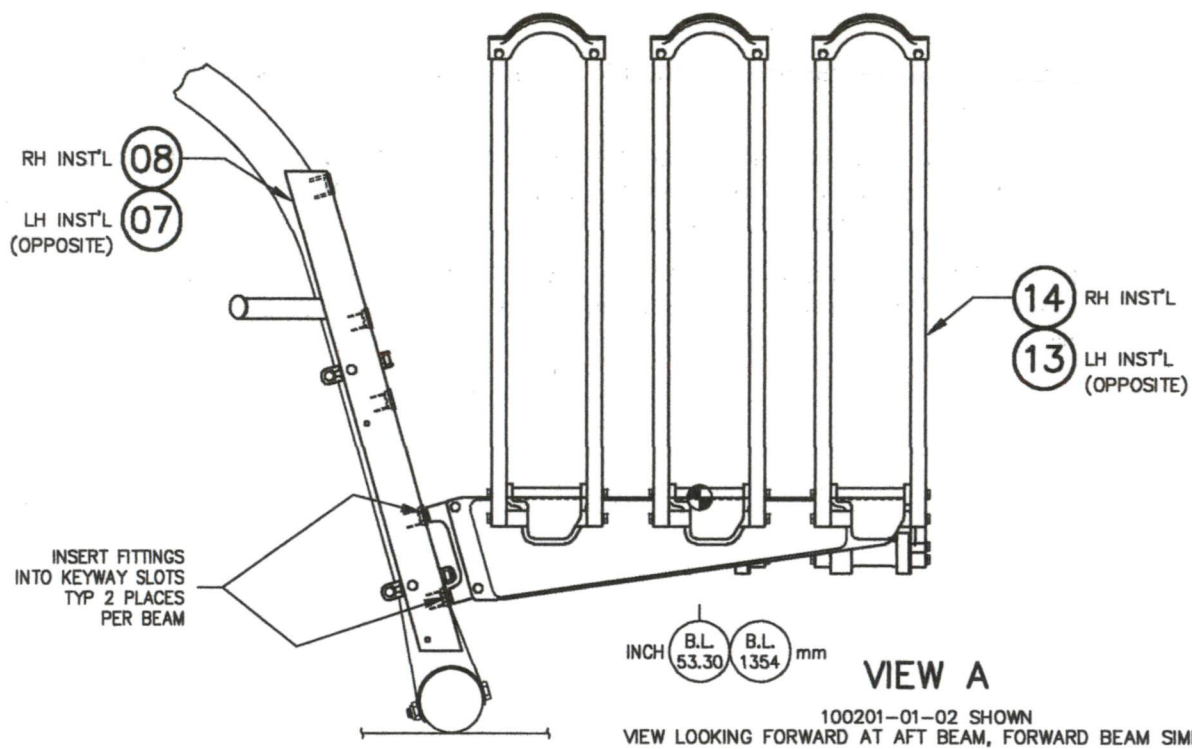


Figure 25.1 – EC130 Bicycle Rack Attachment

Item	Qty.	Part Number	Description
01		100201-01-01	AS350 Low LH Bicycle Rack Installation
08	. 1	78602-01-02	AS350 Low LH Attachment Provisions Installation
13	. 1	100210-01	AS350 LH Bicycle Rack Assembly
02		100201-01-02	AS350 Low RH Bicycle Rack Installation
07	. 1	78602-01-01	AS350 Low RH Attachment Provisions Installation
14	. 1	100210-02	AS350 RH Bicycle Rack Assembly
03		100201-02-01	AS350 High LH Bicycle Rack Installation
(09)	. 1	78602-02-02	AS350 High LH Attachment Provisions Installation
13	. 1	100210-01	AS350 LH Bicycle Rack Assembly
04		100201-02-02	AS350 High RH Bicycle Rack Installation
(10)	. 1	78602-02-01	AS350 High RH Attachment Provisions Installation
14	. 1	100210-02	AS350 RH Bicycle Rack Assembly
05		100201-03-01	AS350 Cargo Pod Compatible LH Bicycle Rack Installation
(11)	. 1	78603-01-02	AS350 Cargo Pod Compatible LH Attachment Provisions Installation
13	. 1	100210-01	AS350 LH Bicycle Rack Assembly
06		100201-04-02	AS350 Cargo Pod Compat. RH Bicycle Rack Installation
(12)	. 1	78603-01-01	AS350 Low LH Attachment Provisions Installation
14	. 1	100210-02	AS350 RH Bicycle Rack Assembly

Table 25.1 – Bill of Materials (AS350 / AS355)

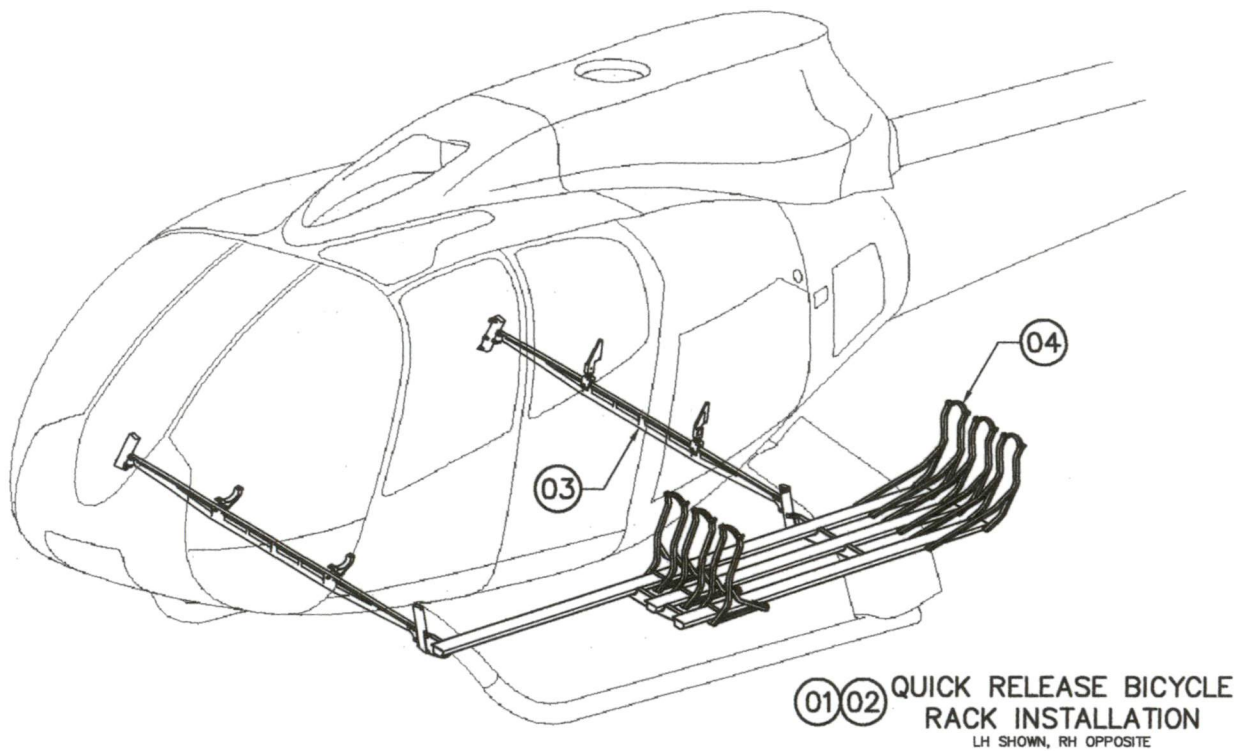


Figure 25.2 – EC130 Bicycle Rack Attachment

Item	Qty.	Part Number	Description
01		100202-01-01	EC130 LH Bicycle Rack Installation
02		100202-01-02	EC130 RH Bicycle Rack Installation
03	. 1	100902-01	Quick Release Mounting Beams Installation
	. . 1	100902-11	Forward Beam Installation
	. . 1	100902-21	Aft Beam Installation
	. 1	100903-01	Attachment Fittings Installation
	. . 1	100903-11	Forward Attachment Fittings Installation
	. . 1	100903-21	Aft Attachment Fittings Installation
04	. 1	100211-01	Bicycle Rack Assembly

Table 25.2 – Bill of Materials (EC130)

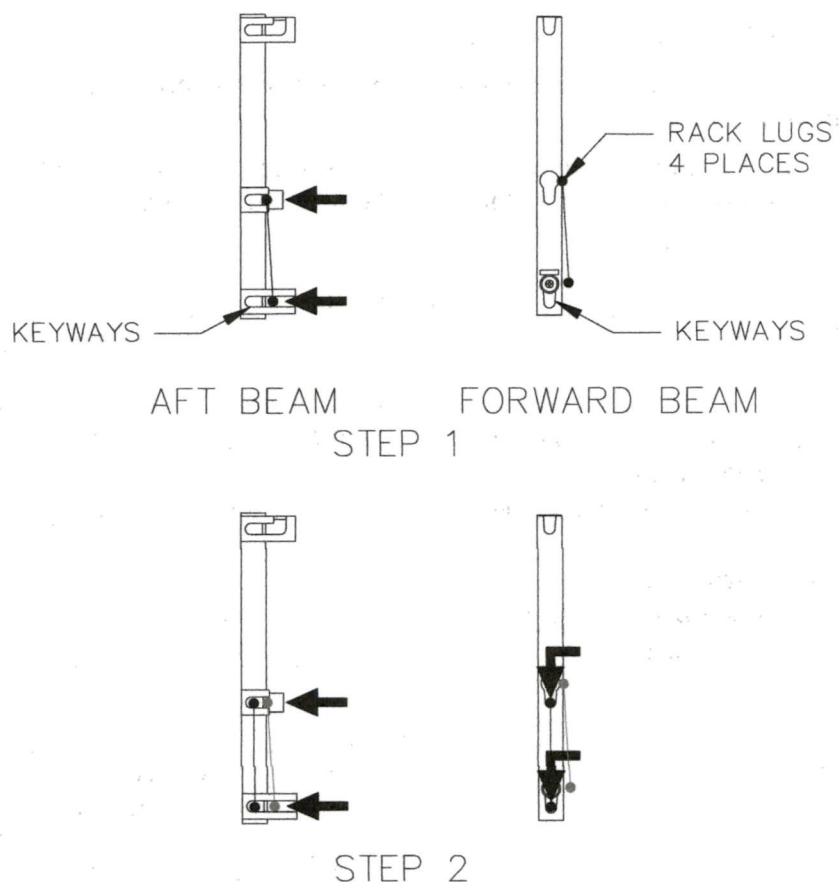


Figure 25.3 – Rack Attachment Steps

(EC130 configuration shown, AS350 / AS355 configuration similar)

25-3 QUICK RELEASE PIN SPRING REPLACEMENT

1. Remove bicycle rack from mounting beams, refer to section 25-1.
2. At lower attachment keyway on forward beam, remove MS21044C3 Nut from #10-32 stainless steel countersunk screw and remove 69830-13 Knob, 69830-12 Stop, and 69830-23 Spring. Discard defective Spring.
3. Place 69830-12 Stop on #10-32 stainless steel countersunk screw. Slide replacement 69830-23 Spring onto Stop. Insert screw/Stop/Spring into guide in lower keyway of aft beam. Install 69830-13 Knob and MS21044C3 Nut on inboard side of beam. Torque nut to 20-25 in-lbs (2.3-2.8 N-m).

25-4 WEIGHT AND BALANCE – AS350 / A355

This section contains weight and balance information for mounting provisions and bicycle rack model 100210.

Two weight and balance configurations are required: Attachment Fittings and Mounting Beams (100902-01); and Bicycle Rack Installed (100201-01-XX).

*Low Mounting Provisions***Standard Units**

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-01-02	LH Low Attachment Provisions	6.4	135.60	867.50	-37.20	-238.00
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.73	-53.30	-3102.06
100201-01-01	LH Low Bicycle Rack Installation	64.6	145.30	9386.23	-51.70	-3340.06
78602-01-01	RH Low Attachment Provisions	6.4	135.60	867.50	37.20	238.00
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.73	53.30	3102.06
100201-01-02	RH Low Bicycle Rack Installation	64.6	145.30	9386.23	51.70	3340.06

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-01-02	LH Low Attachment Provisions	2.9	3443.00	9970.60	-944.60	-2735.40
100210-01	LH Bicycle Rack Assembly	26.4	3717.80	98146.55	-1353.82	-35739.64
100201-01-01	LH Low Bicycle Rack Installation	29.3	3690.12	108117.15	-1313.18	-38475.04
78602-01-01	RH Low Attachment Provisions	2.9	3443.00	9970.60	944.60	2735.40
100210-01	RH Bicycle Rack Assembly	26.4	3717.80	98146.55	1353.82	35739.64
100201-01-02	RH Low Bicycle Rack Installation	29.3	3690.12	108117.15	1313.18	38475.04

Table 25.3 – Weight and Balance

*High Mounting Provisions***Standard Units**

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-02-02	LH High Attachment Provisions	6.4	135.60	867.50	-36.50	-233.80
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.73	-52.53	-3057.25
100201-02-01	LH Bicycle Rack Installation (total)	64.6	145.30	9386.23	-50.94	-3291.05
78602-02-01	RH Low Attachment Provisions	6.4	135.60	867.50	36.50	233.80
100910-01	RH Bicycle Rack Assembly	58.2	146.37	8518.73	52.53	3057.25
100902-02-02	RH Bicycle Rack Installation (total)	64.6	145.30	9386.23	50.94	3291.05

High Mounting Provisions (continued)

Metric Units						
P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78602-02-02	LH Low Attachment Provisions	2.9	3443.00	9970.60	-928.10	-2687.60
100210-01	LH Bicycle Rack Assembly	26.4	3717.80	98146.55	-1334.26	-35223.33
100901-02-01	LH Bicycle Rack Installation (total)	29.3	3690.12	108117.15	-1293.93	-37910.93
78602-02-01	RH Low Attachment Provisions	2.9	3443.00	9970.60	928.10	2687.60
100210-01	RH Bicycle Rack Assembly	26.4	3717.80	98146.55	1334.26	35223.33
100201-02-02	RH Bicycle Rack Installation (total)	29.3	3690.12	108117.15	1293.93	37910.93

Table 25.3 – Weight and Balance

Cargo Pod Compatible Mounting Provisions

Standard Units						
P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78603-01-02	LH Low Attachment Provisions	6.8	135.40	921.00	-38.80	263.60
100210-01	LH Bicycle Rack Assembly	58.2	146.37	8518.73	-55.30	3218.46
100201-03-01	LH Bicycle Rack Installation (total)	65.0	145.23	9439.73	-53.57	3482.06
78603-01-01	RH Low Attachment Provisions	6.8	135.40	921.00	38.80	263.60
100210-01	RH Bicycle Rack Assembly	58.2	146.37	8518.73	55.30	3218.46
100201-03-02	RH Bicycle Rack Installation (total)	65.0	145.23	9439.73	53.57	3482.06

Metric Units						
P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
78603-01-02	LH Low Attachment Provisions	3.1	3440.10	10 584.8	-984.60	-3029.60
100210-01	LH Bicycle Rack Assembly	26.4	3717.80	98146.55	-1404.62	-37080.71
100201-03-01	LH Bicycle Rack Installation (total)	29.5	3327.10	98146.55	-1359.71	-40110.31
78603-01-01	RH Low Attachment Provisions	3.1	3440.10	10 584.8	984.60	3029.60
100210-01	RH Bicycle Rack Assembly	26.4	3717.80	98146.55	1404.62	37080.71
100201-03-02	RH Bicycle Rack Installation (total)	29.5	3327.10	98146.55	1359.71	40110.31

Table 25.3 – Weight and Balance

25-5 WEIGHT AND BALANCE – EC130

This section contains weight and balance information for bicycle rack model 100211.

Two weight and balance configurations are required: Attachment Fittings and Mounting Beams (100902-01); and Bicycle Rack Installed (100201-01-XX).

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
100902-01	Mounting Beams Installation (including 100903-01)	46.0	102.21	4699.53	0.00	0.00
100210-01	LH Bicycle Rack Assembly	65.0	100.90	6558.50	-56.70	-3685.50
100201-01-01	LH Bicycle Rack Installation (total)	111.0	101.44	11258.0	-33.21	-3685.50
100910-01	RH Bicycle Rack Assembly	65.0	100.90	6558.50	56.70	3685.50
100901-01-02	RH Bicycle Rack Installation (total)	111.0	101.44	11258.0	33.21	3685.50
100910-01	LH Bicycle Rack Assembly	65.0	100.90	6558.50	-56.70	-3685.50
100910-01	RH Bicycle Rack Assembly	75.0	100.90	7567.50	56.90	4267.50
100901-01 -01/-02	Dual Bicycle Rack Installation (total)	176.0	101.24	17816.5	0.00	0.00

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
100902-01	Mounting Beams Installation (including 100903-01)	19.5	2591.21	50540.31	0.00	0.00
100210-01	LH Bicycle Rack Assembly	29.5	2562.86	75562.18	-1440.18	-42461.60
100201-01-01	LH Bicycle Rack Installation (total)	49.0	2574.15	126102.5	-866.78	-42461.6
100910-01	RH Bicycle Rack Assembly	29.5	2562.86	75562.18	1440.18	42461.60
100901-01-02	RH Bicycle Rack Installation (total)	49.0	2574.15	126102.5	866.78	42461.6
100910-01	LH Bicycle Rack Assembly	29.5	2562.86	75562.18	-1440.18	-42461.60
100910-01	RH Bicycle Rack Assembly	29.5	2562.86	75562.18	1440.18	42461.60
100901-01 -01/-02	Dual Bicycle Rack Installation (total)	78.5	2569.91	201664.7	0.00	0.0

Table 25.6 – Weight and Balance

25-6 STRUCTURAL FASTENER DATA

Refer to Airbus Helicopters (Eurocopter) Standard Practices Manual for torque values not listed in this ICA.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 1010.90

AIRBUS HELICOPTERS EC130 B4

QUICK RELEASE CABIN STEP

TCCA Supplemental Type Certificate No. SH08-16
FAA Supplemental Type Certificate No. SR02680NY
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Step is installed in accordance with Aero Design Ltd. Document Control List DCL1010-1, Revision 0, or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 25 September 2015

Aero Design Ltd.



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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	25 September 2015	N/A	Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue) 25 September 2015

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4	0
	5	0
04-00-00	6	0
05-00-00	7	0
	8	0
	9	0
25-50-00	10	0
	11	0

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Step as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Step. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

0-5 GENERAL DESCRIPTION

The Quick Release Step installation consists of a step assembly which is attached to quick release mounting provisions installed on the helicopter. These mounting provisions are capable of mounting various equipment including cargo baskets.

The step itself consists of an aluminum extrusion welded to brackets on the ends with fittings that lock into the quick release mechanism on the mounting beams.

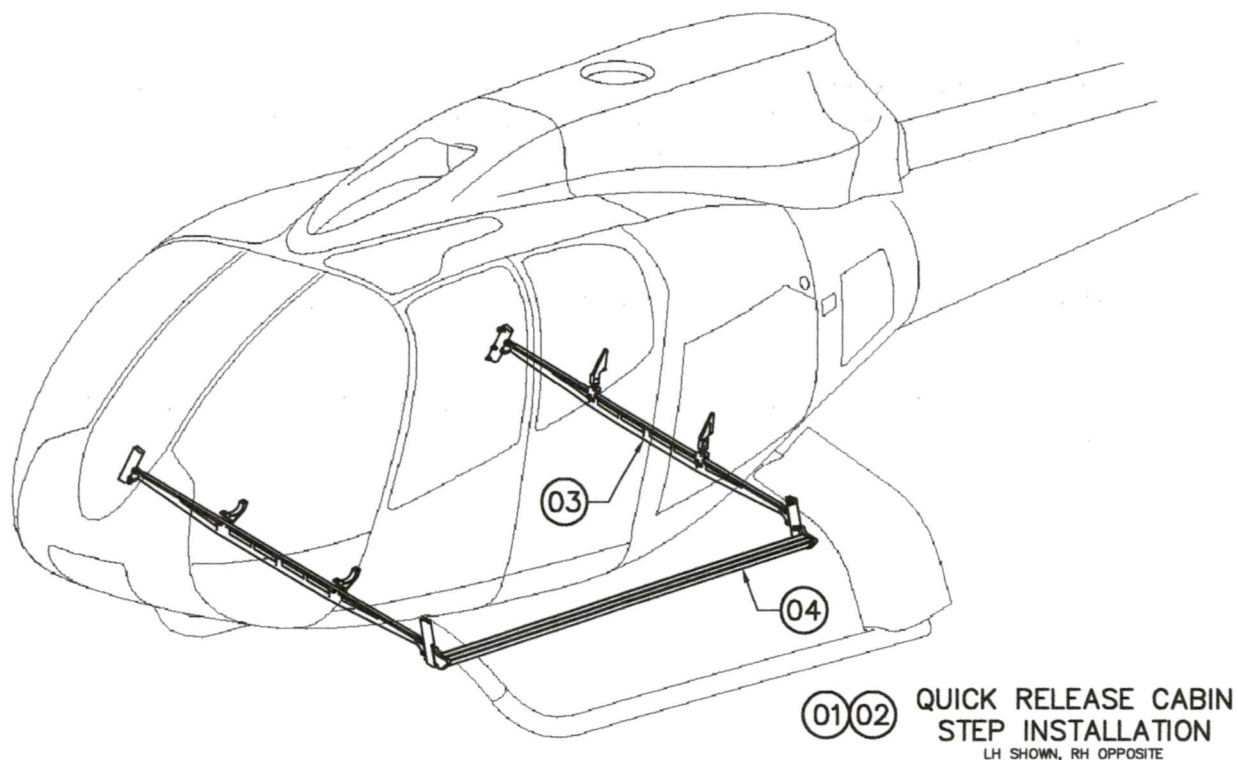


Figure 0.1 – EC130 Step Installation

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due to installation of the Quick Release Step.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Step.

Refer to the ICA1009.90 for the EC130 Quick Release Cargo Basket for inspection requirements for the mounting provisions.

Daily Inspection

1. Inspection Area: Step

- a) Inspect the step attachment to the beams for condition and security. Ensure the quick release mechanism is completely extended, flush with the outboard surface of the beam.

300 Hour or Annual Inspection

1. Inspection Area: Step

- a) Visually inspect welds attaching end brackets to step extrusion for cracks, corrosion or other damage.
- b) Visually inspect step for damage.
- c) Visually inspect lugs attaching the step to the beams for security and damage.

Special Inspections

Following a hard landing inspect the Quick Release Step installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

Refer to the ICA1009.90 for the Quick Release Cargo Basket for damage limits and repair instructions for the mounting provisions.

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Step Assembly

Part	Type of Damage	Max. Allowable	Repair
Step End Bracket	Corrosion	0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 0.5" long	Blend up to 0.010" deep with scotchbrite.
	Cracks/Dents	None	N/A
	Bent Lugs	None	N/A
Centre Step Section	Corrosion	2" x 2" x 0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 1" long	Blend up to 0.010" deep with scotchbrite.
	Cracks / Dents	None	N/A
	Permanent Deflection of Step	0.25" max at middle of step	None

2. Steel Beams

Part	Type of Damage	Max. Allowable	Repair
Steel Beam	Corrosion	0.030" deep	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (Outboard face)	0.030" deep x 0.125" wide	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (all other sides)	0.060" deep x 0.125" wide	Blend up to 0.060" deep with scotchbrite.
	Cracks	None	N/A
	Dents (forward beam upper cap)	Unlimited - without cracking	Upper cap may be manually straightened.
	Dents (all other surfaces)	None	
	Elongation of Keyway	See figure 5.1	None
	Widening of slots	See figure 5.1	None

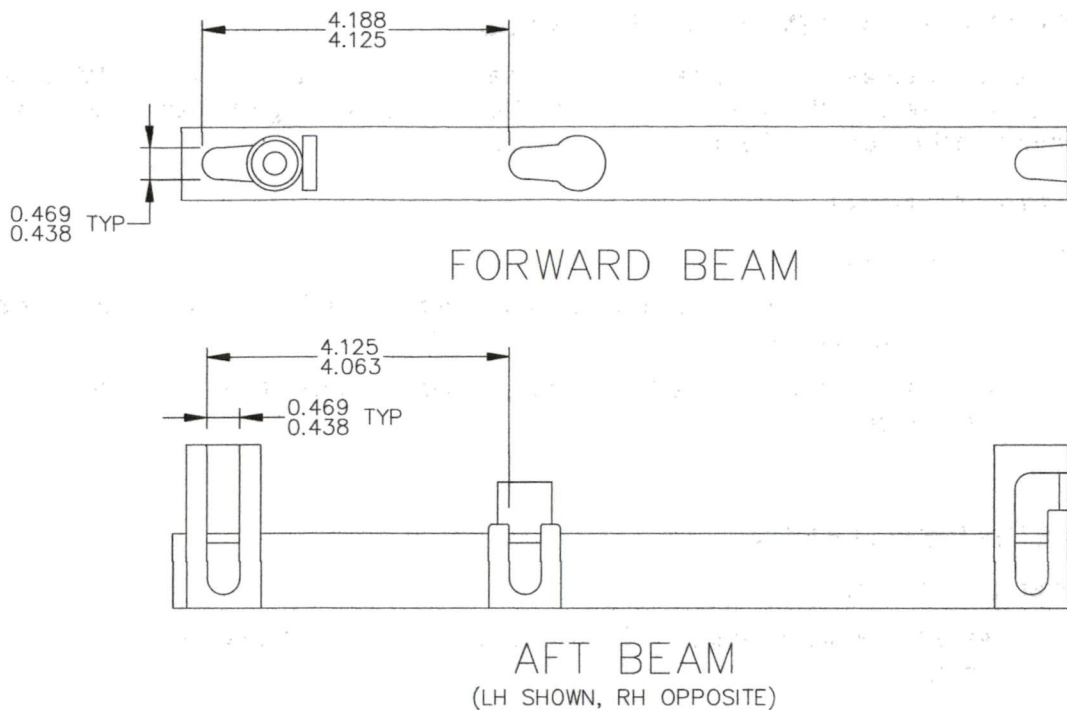


Figure 5.1 – Critical Keyway dimensions

3. Step Welds

Cracks up to 0.25" long may be repaired as follows:

- a) Clean area of paint.
- b) Grind away weld in area of crack.
- c) T.I.G. weld per MIL-STD-2219 Class "C" using ER4043 filler rod. Do not grind flush.
- d) Touch up paint as noted in section 5-3.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Step Assembly

The Step Assembly is supplied powder coated or painted. If the finish is damaged, touch up with polyurethane paint. The tread area has 2 strips of grip tape applied to improve traction. If the grip tape is damaged, replace with 1 inch (25 mm) wide grip tape or apply Randolph X1567 Wingwalk grip paint or equivalent.

CHAPTER 25 – EQUIPMENT AND FURNISHINGS

The Quick Release Step Installation may be applied to the right and/or left side of the helicopter. Refer to the ICA1009.90 for the Quick Release Cargo Basket for installation and removal instructions for the mounting provisions.

25-1 STEP REMOVAL

Refer to Figure 25.1.

1. Pull knob at bottom end of forward beam and lift forward end of step until attachment fittings are free of keyways.
2. Slide step forward until aft attachment fittings are free of keyways and remove from helicopter.

25-2 STEP INSTALLATION

Refer to Figure 25.1.

1. At aft mounting beam, slide step attachment fittings into keyways on mounting beam.
2. At forward mounting beam, slide step aft and lift step until attachment fitting hits stop over keyway. Push fittings into keyways and slide step down until locked.

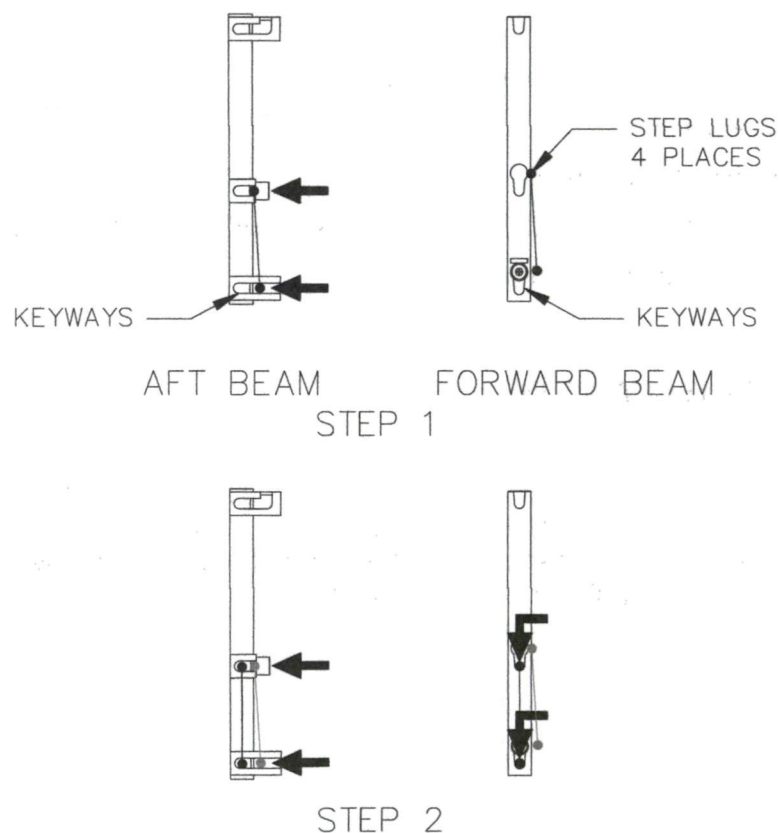


Figure 25.1 – Step Attachment

25-3 WEIGHT AND BALANCE

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Step Installation						
100902-01	Provisions Installation	46.0	102.21	4699.53	0.00	0.00
101010-01	Step Assembly	7.2	100.90	726.48	-47.00	-338.40
101001-01-01	LH Step Installation (Total)	53.2	102.03	5426.01	-6.36	-338.40
100902-01	Provisions Installation	46.0	102.21	4699.53	0.00	0.00
101010-01	Step Assembly	7.2	100.90	726.48	47.00	338.40
101001-01-02	RH Step Installation (Total)	53.2	102.03	5426.01	6.36	338.40
100902-01	Provisions Installation	46.0	102.21	4699.53	0.00	0.00
101010-01	Step Assembly	7.2	100.90	726.48	-47.00	-338.40
101010-01	Step Assembly	7.2	100.90	726.48	47.00	338.40
101001-01 -01/-02	Dual Step Installation (Total)	60.4	101.90	6152.49	0.00	0.00

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step Installation						
100902-01	Provisions Installation	19.50	2591.21	50540.31	0.00	0.00
101010-01	Step Assembly	3.27	2562.86	8369.96	-1193.80	-3898.79
101001-01-01	LH Step Installation (Total)	22.8	2587.15	58910.3	-171.22	-3898.8
100902-01	Provisions Installation	19.50	2591.21	50540.31	0.00	0.00
101010-01	Step Assembly	3.27	2562.86	8369.96	1193.80	3898.79
101001-01-02	RH Step Installation (Total)	22.8	2587.15	58910.3	171.22	3898.8
100902-01	Provisions Installation	19.50	2591.21	50540.31	0.00	0.00
101010-01	Step Assembly	3.27	2562.86	8369.96	-1193.80	-3898.79
101010-01	Step Assembly	3.27	2562.86	8369.96	1193.80	3898.79
101001-01 -01/-02	Dual Step Installation (Total)	26.0	2584.10	67280.2	0.00	0.00

Table 25.1 – Weight and Balance

25-4 STRUCTURAL FASTENER DATA

Refer to the Standard Practices Manual for torque values not listed in this ICA.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 1009.90

AIRBUS HELICOPTERS EC130 B4

QUICK RELEASE MOUNTING PROVISIONS

QUICK RELEASE CARGO BASKET

TCCA Supplemental Type Certificate No. SH08-16
FAA Supplemental Type Certificate No. SR02680NY
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Mounting Provisions and Cargo Basket are installed in accordance with Aero Design Ltd. Document Control Lists:

- DCL1009-1 (Cargo Basket Installation), Revision 0,
 - DCL1009-2 (Quick Release Mounting Provisions Installation), Revision 0,
- or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 22 September 2015

Aero Design Ltd.



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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	22 September 2015	N/A	Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue)

22 September 2015

List of Effective Pages

<u>Description</u>	<u>Page</u>	<u>Revision</u>	<u>Description</u>	<u>Page</u>	<u>Revision</u>
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	15	0		34	0
	16	0		35	0
	17	0			
	18	0			
	19				

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Mounting Provisions and Cargo Basket Installation as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

CAUTION : This installation is NOT compatible with fixed or pop-out float installations.

0-5 GENERAL DESCRIPTION

The Quick Release Mounting Provisions consist of hard points installed on the helicopter, on the forward landing gear cross tube attachment at the front and on the aft fuel tank cross member at the rear, and mounting beams that span the width of the helicopter with down tubes that accept the cargo basket or other installed equipment.

The cargo basket is made of a steel welded tubing structure, and lined with expanded steel mesh. The basket has a hinged lid with a self-locking handle. The quick release basket allows for the installation and removal of the basket without tools, leaving the mounting beams in place.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Mounting Provisions and Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket

- a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain basket, replace spring, refer to section 25-9.
- b) Inspect latching of the lid for correct operation. Replace handle brackets on basket if handle is not retained in latched position. Refer to section 25-6.

300 Hour or Annual Inspection

1. Inspection Area: Basket

- a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
- b) Visually inspect basket mesh for damage.
- c) Visually inspect lid prop for condition and operation. Ensure prop does not extend beyond catch and catch extends to hold lid open. Refer to section 25-8 for lid prop replacement.
- d) Visually inspect handle for condition and operation. Ensure springs on lid brackets hold handle in to guide handle to engage secondary catch on handle brackets. Refer to section 25-7 for handle spring replacement.
- e) Visually inspect lugs attaching the basket to the beams for security and damage.

2. Inspection Area: Mounting Beams and Attachment Fittings

With the basket removed:

- a) Visually inspect down tubes attaching basket to the helicopter for cracks, corrosion or other damage.
- b) Visually inspect mounting beams attaching basket to the helicopter for cracks, corrosion or other damage.
- c) Visually inspect attachment points of down tube to aluminum mounting beam. Remove fasteners and inspect the holes in the aluminum for cracks, corrosion or elongation.
- d) Visually inspect attachment points of aluminum mounting beams to fuselage attachment fittings. Remove fasteners and inspect the holes in the aluminum for cracks, corrosion or elongation.

- e) Visually inspect fasteners attaching down tubes to mounting beams and mounting beams to fuselage fittings for condition and security.
- f) Visually inspect attachment fittings at forward cross tube and aft fuel tank cross member for cracks, corrosion or other damage.
- g) Visually inspect stud fitting and 12 jaw fitting on aft mounting fitting for condition, security and operation.

Special Inspections

- 1. Following a hard landing inspect the Quick Release Mounting Provisions and Cargo Basket installation in accordance with the 300 hour or annual inspection listed above.
- 2. Any joints using a helical thread insert (Helicoil) shall be inspected on assembly in accordance with the procedure for checking self locking nuts and screws specified in the Eurocopter Standard Practices Manual, Section 20.02.05.601

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket and Lid Tubing

Damage Limits:

- a) Deformation of any tubing between welded joints not exceeding 0.25 inches (6.4 mm) in any direction must be repaired in accordance with the instructions below.
- b) Corrosion not exceeding 0.015 inches (0.4 mm) deep to be buffed out to a smooth contour.
- c) Corrosion exceeding 0.015 inches (0.4 mm) deep to be repaired in accordance with the instructions below.

Repair Instructions:

- a) Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
- b) Basket is fabricated from the following materials:
 - Attachment Hoops: 1/2" square steel tube
 - Lid and Rim: 3/4" square steel tube
 - Frames: 1/2" square steel tube
- c) Touch up with polyurethane paint as required following repairs.

2. Basket and Lid Mesh

Damage Limits:

- a) The basket mesh may be deformed or stretched without limit, so long as the welds attaching the mesh to the basket or lid are not compromised. If welds are compromised, repair in accordance with instructions below.
- b) Tears in the mesh not exceeding 4 cells in any direction may be repaired by patching. Maximum one repair patch per bay. See instructions below.

Repair Instructions:

- a) Repair mesh to tube welds in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.

Mesh: $\frac{3}{4}$ " 16 ga. (0.040 inch) expanded steel mesh

b) Patch repair:

- a. Cut two aluminum sheets, minimum 0.040 inches (1 mm) thick, extending to at least 1 complete cell outside of torn area. Drill #9 (0.196, 5 mm) holes in the corners of the sheet, located to clear the mesh when installed.
- b. Attach patches, one inside and one outside, to the mesh with AN3 Bolts, AN970-3 Washers, and MS21044N3 Nuts.

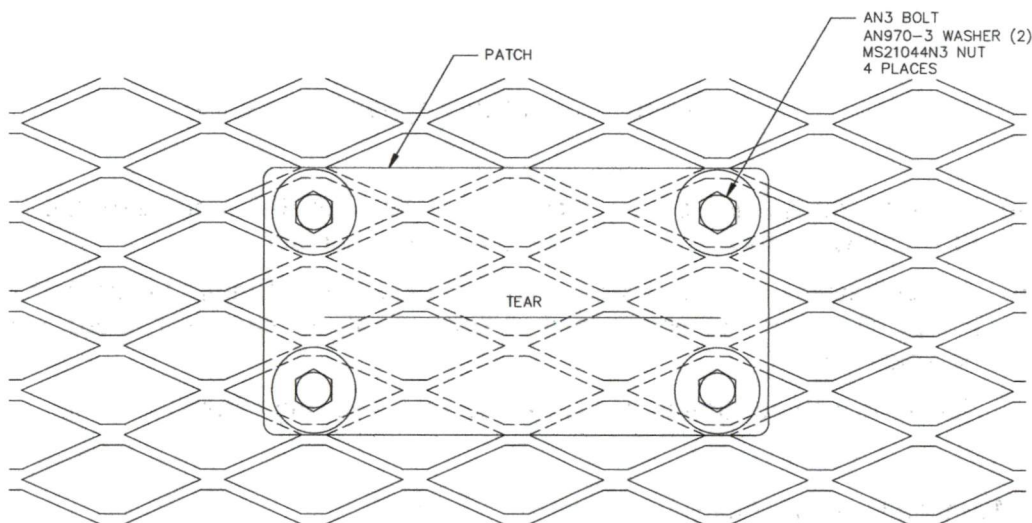


Figure 5.1 – Patch Repair

- c) Touch up with polyurethane paint as required following repairs.

3. Mounting Beams – Down Tubes

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

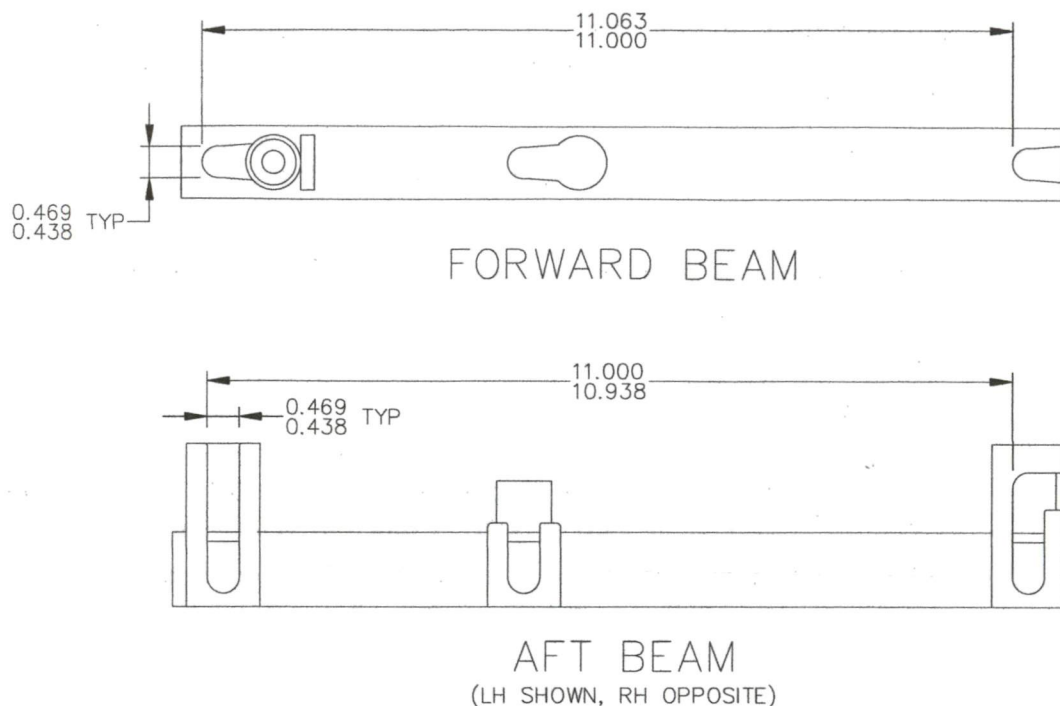


Figure 5.2 – Critical Keyway Dimensions

- a) Nicks and/or gouges on any face up to 0.030 inch (0.8 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour.
- b) Critical keyway dimensions are shown in Figure 5.2. Attempt to insert 15/32 (0.469 inch) drill shank into bottom end of keyway. If drill can be inserted, slot is worn beyond limit.
- c) Touch up with polyurethane paint as required following repairs.

4. Mounting Beams – Aluminum Beam

DO NOT REPAIR DAMAGE TO ALUMINUM BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on any surface up to 0.030 inch (0.8 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour. Refer to Figure 5.3.
- b) Corrosion on any surface up to 0.010 inch (0.3 mm) deep not exceeding 1 in² (640 mm²) may be dressed out to a smooth contour. Maximum 5 places per beam, minimum 6 inches (150 mm) between repairs.
- c) Any cracking on any surface is not acceptable.
- d) Down tube attachment holes on the outboard ends of the mounting beam are nominally 0.323 inch (8.2 mm). Elongation beyond 0.343 inch (11/32) (8.7 mm) diameter in any direction is not acceptable.

- e) Forward beam: Fuselage attachment holes are nominally 0.386 inch (9.8 mm) diameter. Elongation beyond 0.406 inch (13/32) (10.3 mm) in any direction requires bushing the hole. Ream hole to 0.500" (+0.0005/-0.0000) and insert NAS79A6-100 bushing.
- f) Aft beam: Adapter fitting mounting holes are nominally 0.257 inch (6.5 mm) diameter. Elongation beyond 0.281 inch (9/32) (7.1 mm) in any direction requires bushing the hole. Ream hole to 0.375" (+0.0005/-0.0000) and insert NAS79A4-100 bushing.

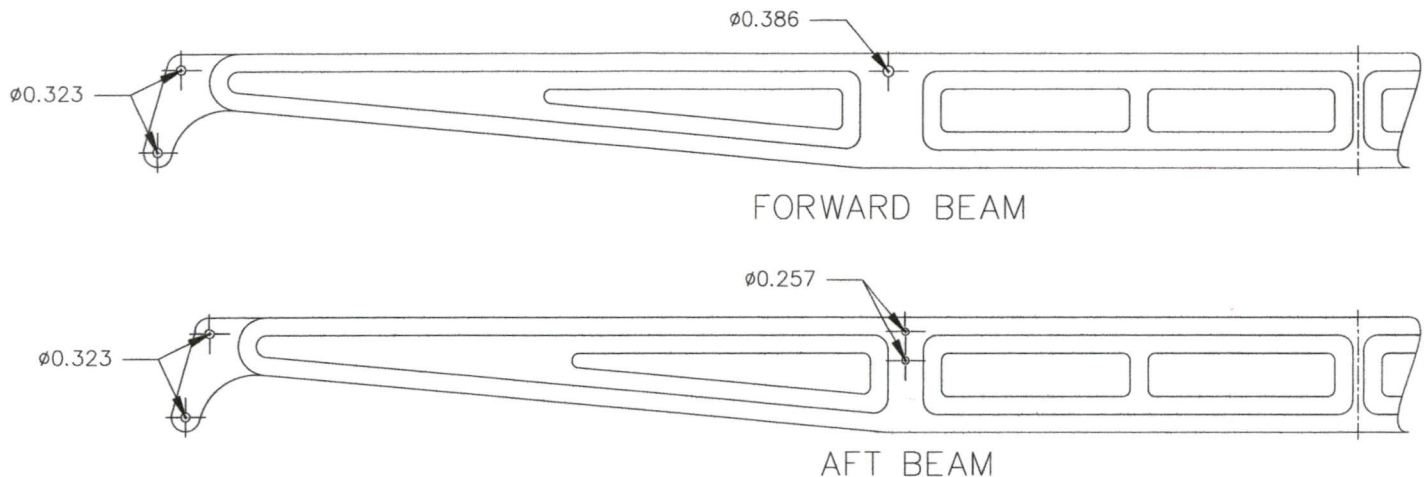


Figure 5.3 – Aluminum Beam

5. Fuselage Attachment Fittings

DO NOT REPAIR DAMAGE TO CLAMPS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on any surface up to 0.030 inch (0.8 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour. Refer to Figure 5.4.
- b) Any cracking on any surface is unacceptable.
- c) Forward landing gear strap fitting: Mounting holes are nominally 0.323 inch (8.2 mm) diameter. Elongation of mounting holes is not acceptable
- d) Forward landing gear strap fitting: Barrel nut hole is nominally 0.755 inch (19.2 mm) diameter. Elongation of hole is not acceptable.
- e) Aft attachment fitting: Mounting holes are nominally 0.323 inch (8.2 mm) diameter. Elongation of mounting holes is not acceptable
- f) Aft attachment fitting: Barrel nut hole is nominally 0.695 inch (17.7 mm) diameter. Elongation of hole is not acceptable.

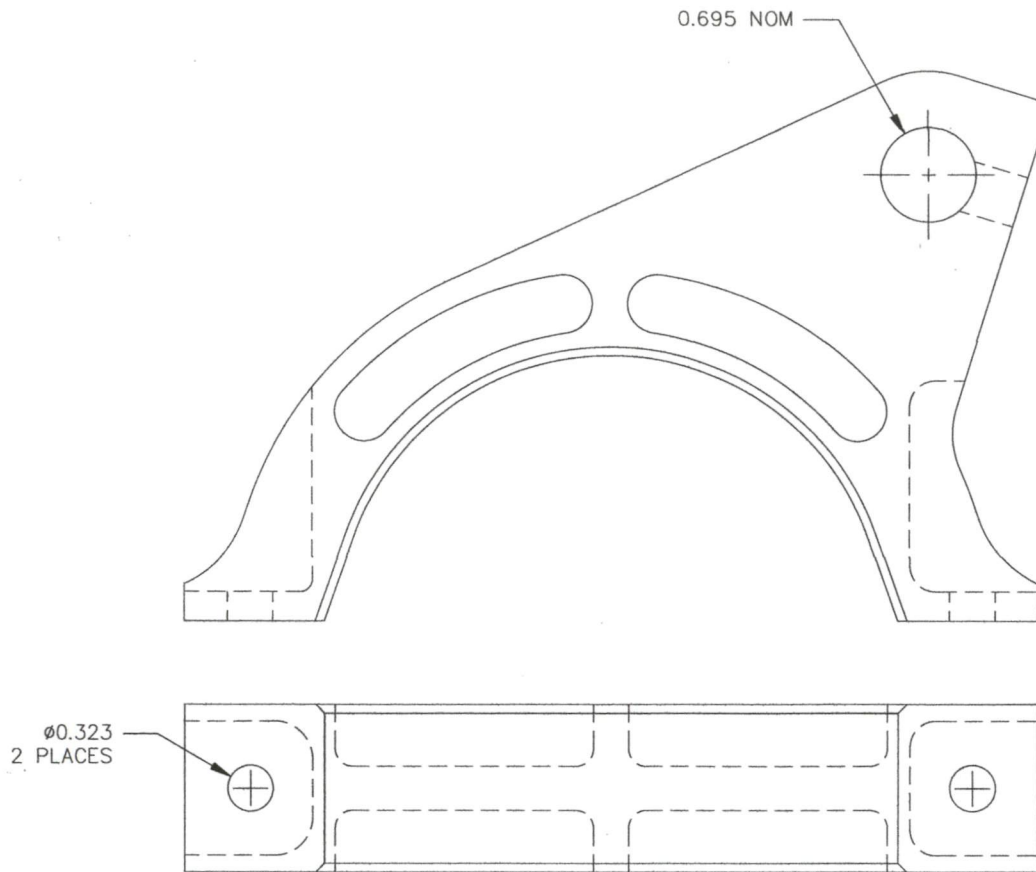


Figure 5.4 – Forward Landing Gear Strap Fitting

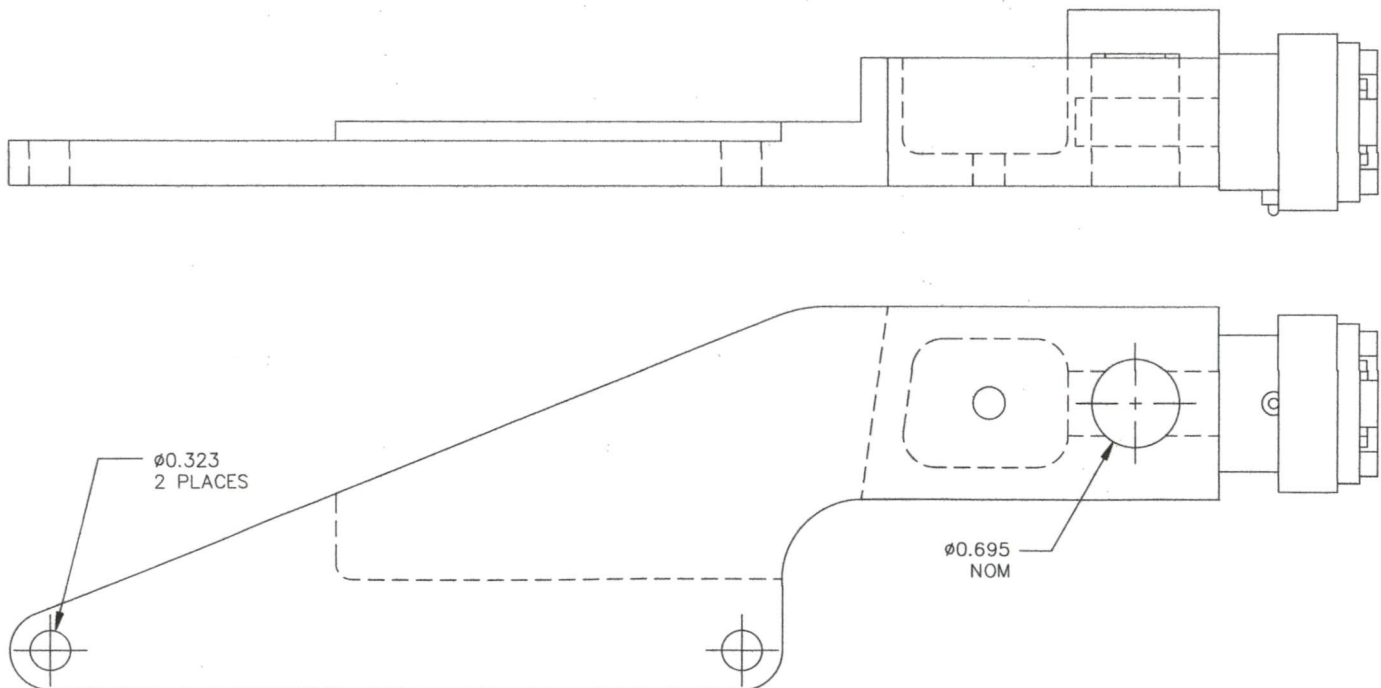


Figure 5.5 – Aft Attachment Fitting

6. Helical Thread Inserts

Helical thread inserts (Helicoils) found to be damaged shall be repaired in accordance with the Airbus Helicopters (Eurocopter) Standard Practices Manual, Section 20.03.04.404.

Part numbers:

1/4-28 insert: 3591-4CN375

3/8-24 insert: 3591-6CN563

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The steel down tubes are supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

Alternate: The steel down tubes are supplied painted. If the paint is damaged, touch up with polyurethane paint.

The aluminum mounting beams are supplied anodized. If the anodizing is damaged, prime with epoxy urethane primer and paint with polyurethane paint.

Alternate: The aluminum mounting beams are supplied painted. If the paint is damaged, touch up with polyurethane paint.

2. Attachment fittings

The aluminum attachment fittings are supplied painted. If the paint is damaged, touch up with polyurethane paint.

3. Cargo Basket

The cargo basket is supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation, located on basket lid:

a) Cargo Basket, Model 1009

Basket S/N 100901-01 and sub.



CHAPTER 25 – EQUIPMENT AND FURNISHINGS**SECTION 50 – CARGO COMPARTMENTS****25-1 ATTACHMENT FITTINGS REMOVAL**

Refer to Figure 25.1 and 25.2.

1. Remove equipment (cargo basket, step, etc.) installed on mounting beams.
2. Remove mounting beams, refer to section 25-3.
3. Remove lower forward right, lower forward left and aft cowlings. Refer to Maintenance Manual chapter 53-51-00.
4. At forward landing gear attachments, remove two bolts (16) with washers (17) from each fitting. Remove forward fittings (cross tube strap) (12), half-bearings (rubber) (13), and support brackets (14 / 15).
5. Install original cross tube straps in accordance with Maintenance Manual chapter 32-11-00, section 4-1.
6. At aft fuel tank cross member, remove four bolts (24 / 25) with washers (27 / 28), shims (26), and nuts (29) from each fitting. Remove fittings (22 / 23).
7. Install original hardware for fuel tank member. Refer to Illustrated Parts Book chapter 25-91-02-03 and Maintenance Manual Chapter 28-11-00, section 4-2.
8. Install lower forward right, lower forward left and aft cowlings. Refer to Maintenance Manual chapter 53-51-00.

25-2 ATTACHMENT FITTINGS INSTALLATION

Refer to Figure 25.1 and 25.2.

1. Ensure there is minimal fuel in the fuel tank.
2. Remove lower forward right, lower forward left and aft cowlings. Refer to maintenance manual section 53-51-00.
3. At forward landing gear attachments, remove two bolts with washers from each cross tube strap. Remove existing cross tube straps, half-bearings (rubber), and support brackets. Retain hardware, half-bearings, and support brackets.
4. Install forward fitting (12) with half-bearing (13) and support bracket (14 / 15) using two bolts (16) with washers (17). Ensure beam mounting face of fitting is forward.
5. Torque 22201BE080 bolts to 17 - 20 ft-lbs (2.3 - 2.7 m-daN).
6. At aft fuel cell cross member, remove the forward upper and lower bolts with washers and shims from left and right sides of the cross member.
7. Install Aft LH Fitting (22) and Aft RH Fitting (23) using:
 - a. Upper: bolt (25), washer (28), shim (26), and nut (29)
 - b. Lower: bolt (24), washer (28), washer (27) and nut (29).
8. Torque 22201BC080 bolts to 14 - 17 ft-lbs (1.9 - 2.3 m-daN).

9. Install lower forward right, lower forward left and aft cowlings. Ensure aft cowling is modified with cut-outs to clear the attachment fittings. Refer to Maintenance Manual

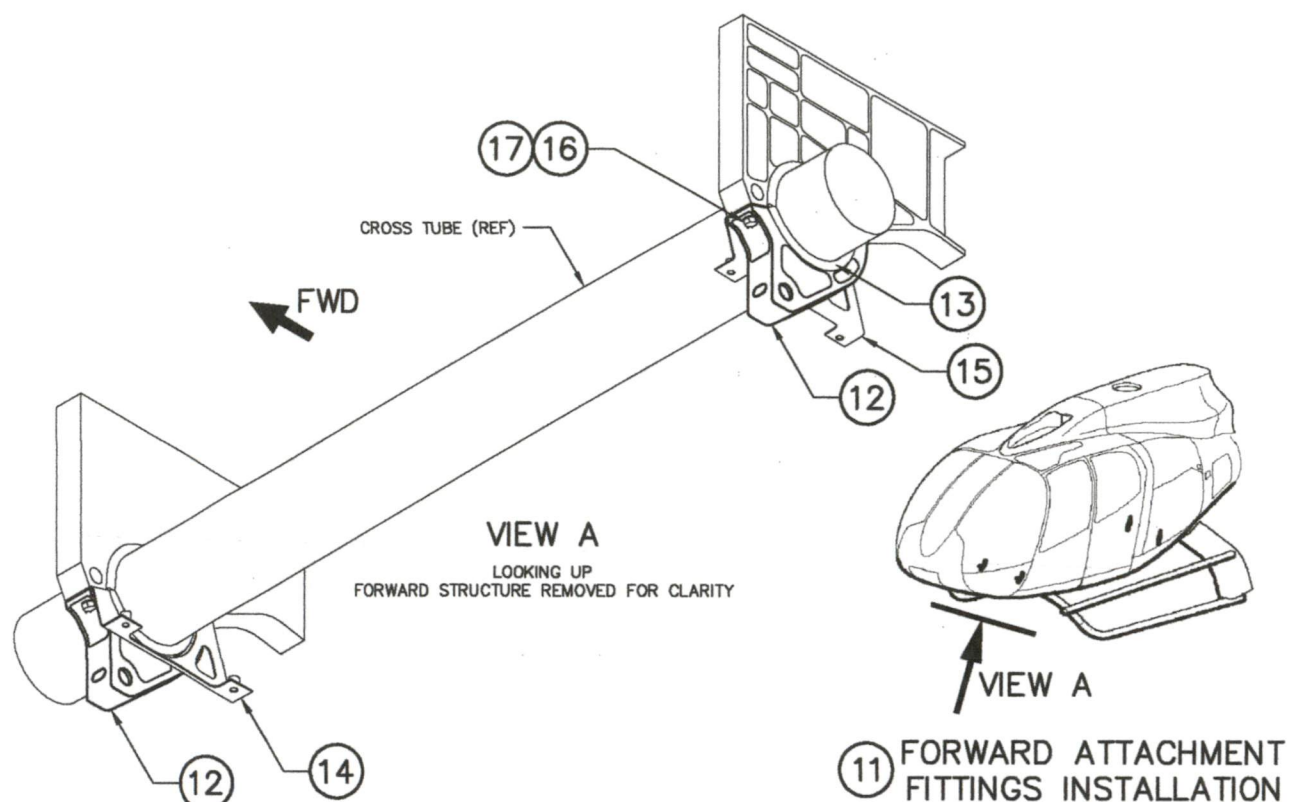


Figure 25.1 – Forward Attachment Fittings

Item	Qty.	Part Number	Description
11		100903-11	Forward Attachment Fittings Installation
12	. 2	100930-01	Forward Fitting
13	. 1	350A41-0054-20	Half-bearing, Forward, Lower
14	. 1	350A21-4058-00	Support Bracket
15	. 2	350A21-4058-01	Support Bracket
16	. 1	22201BE080016L	Bolt
17	. 1	23112AG080LE	Washer

Table 25.1 – Bill of Materials

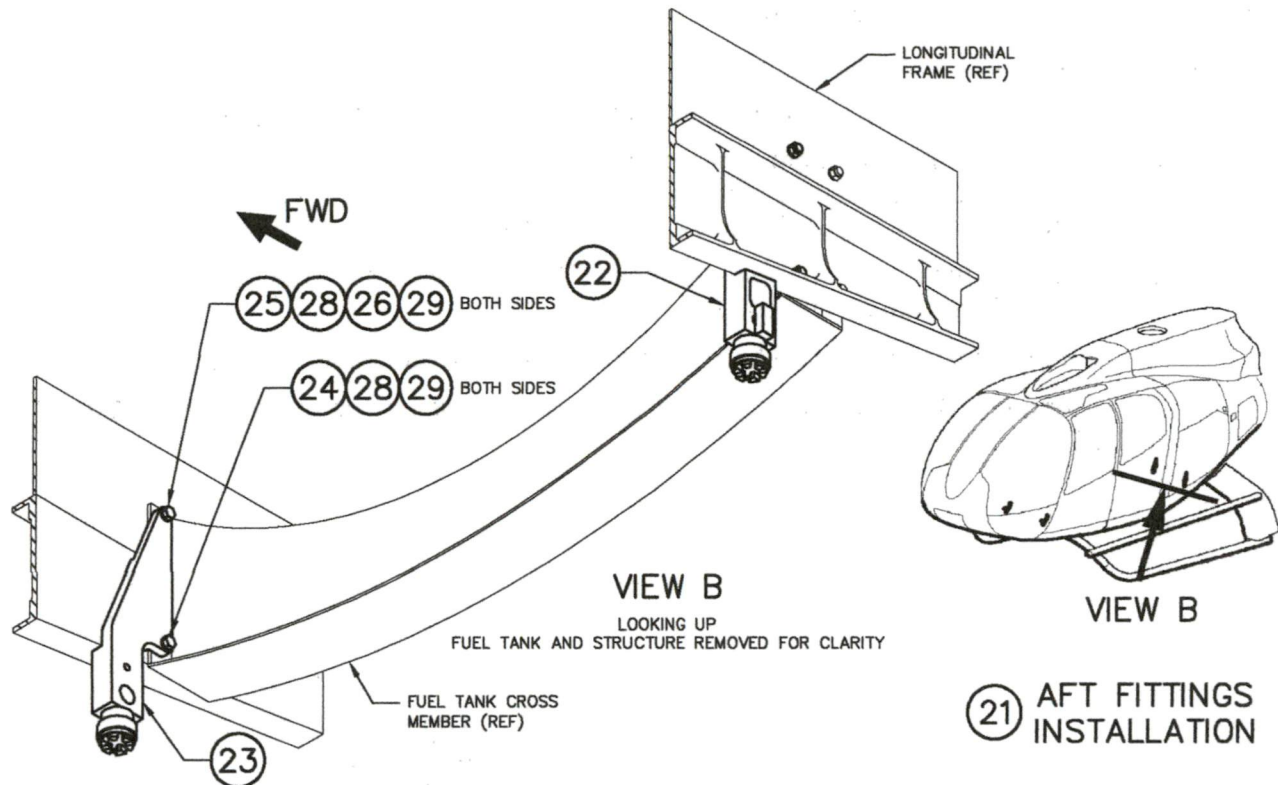


Figure 25.2 – Aft Attachment Fittings

Item	Qty.	Part Number	Description
21		100903-21	Aft Attachment Fittings Installation
22	. 1	100931-01	LH Aft Fitting
23	. 1	100931-02	RH Aft Fitting
24	. 2	22201BC080020L	Bolt
25	. 2	22201BC080018L	Bolt
26	. 2	350A13-1114-21	Shim
27	. 2	23111AG080LE	Washer
28	. 4	23112AG080LE	Washer
29	. 4	ASN52320BH080N	Nut

Table 25.2 – Bill of Materials

25-3 MOUNTING BEAMS REMOVAL

Refer to Figure 25.3 and 25.4.

1. Remove equipment (cargo basket, step, etc.) installed on mounting beams.
2. At forward mounting beam, remove two bolts (14) with washers (15) securing forward mounting beam to landing gear fittings. Remove forward beam (12). Remove barrel nuts (16) from landing gear fittings or secure with AN6 bolt.
3. At aft mounting beam, remove two bolts (26) with washers (27) securing brace (25) to side of attachment fittings. Remove braces.
4. Remove locking rings (24) from 12 jaw fittings on aft attachment fittings.
5. Disengage 12 jaw fittings from mounting beam by sliding ring up. Remove aft beam (22).

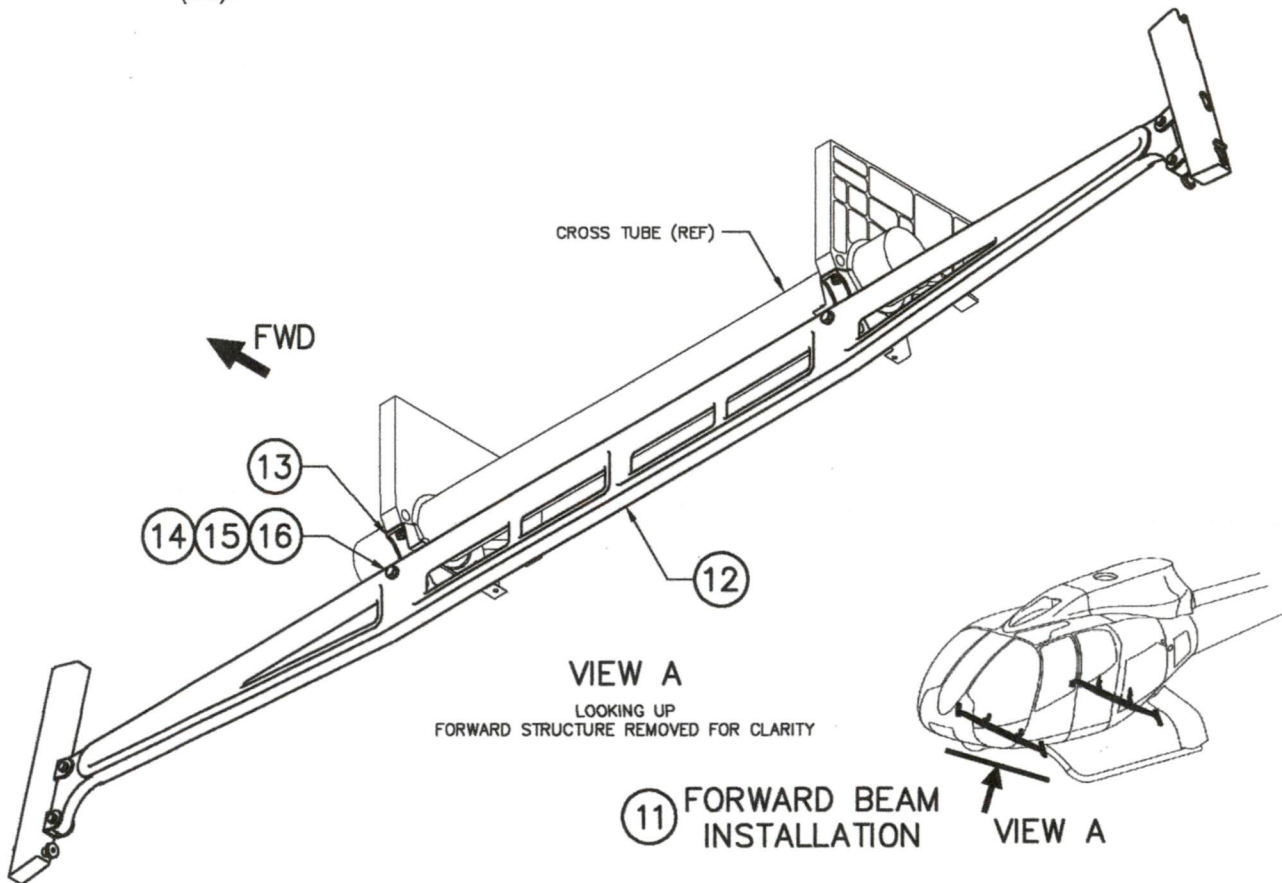


Figure 25.3 – Forward Mounting Beam

Item	Qty.	Part Number	Description
11		100902-11	Forward Beam Installation
12	. 1	100915-01	Forward Beam Assembly
13	. 1	100903-11	Forward Attachment Fittings Installation
14	. 2	AN6-20A	Bolt
15	. 2	NAS1149F0663P	Support Bracket
16	. 1	60624-01	Barrel Nut

Table 25.3 – Bill of Materials

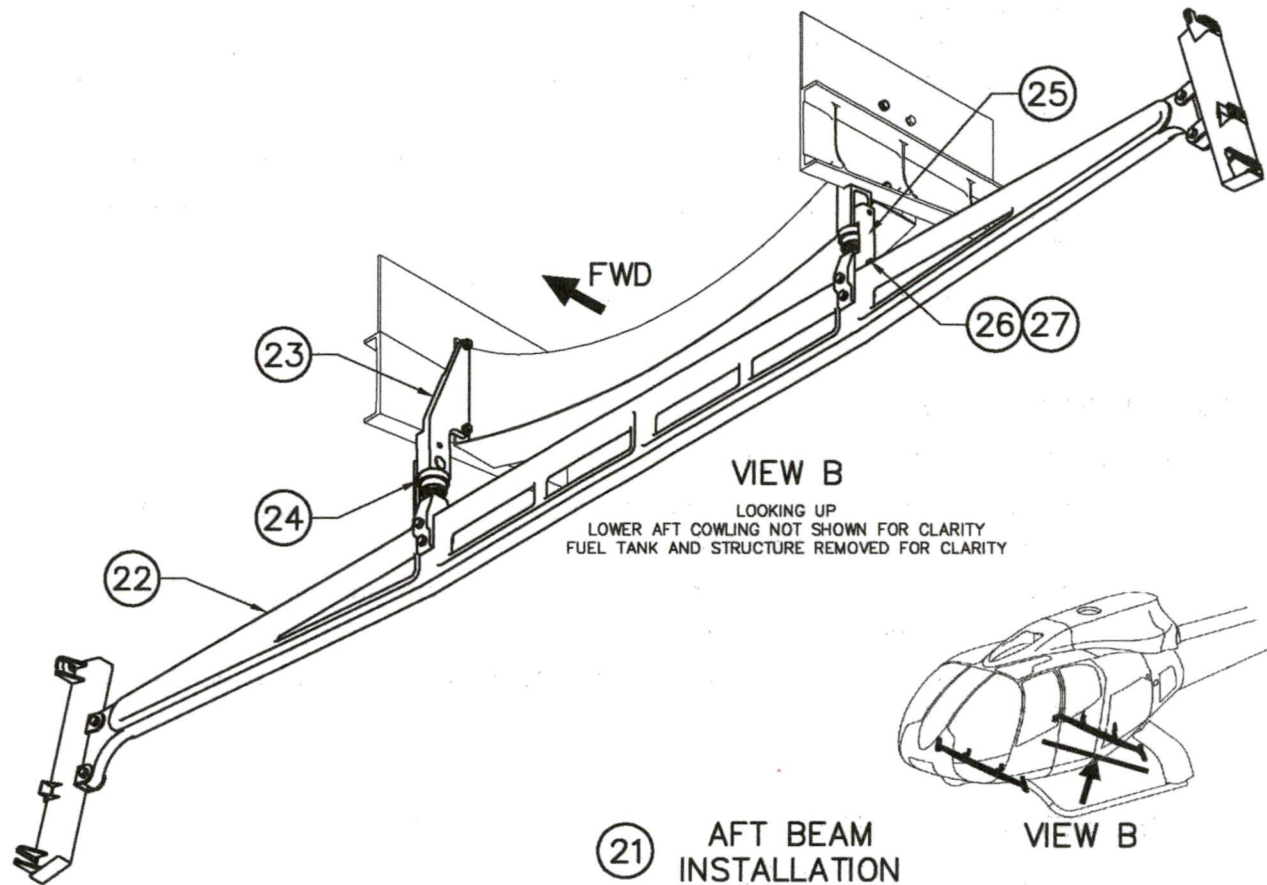


Figure 25.4 – Aft Mounting Beam

Item	Qty.	Part Number	Description
21		100902-21	Aft Beam Installation
22	. 1	100916-01	Aft Beam Assembly
23	. 1	100903-21	Aft Attachment Fittings Installation
24	. 2	75821-05	Lock Ring Assembly
25	. 2	100931-07	Brace
26	. 2	AN4-5A	Bolt
27	. 2	NAS1149F0432P	Washer

Table 25.4 – Bill of Materials

25-4 MOUNTING BEAMS INSTALLATION

Refer to Figure 25.3 and 25.4.

1. Attachment fittings must be installed, refer to section 25-2.
2. At forward landing gear attachments, insert Barrel Nut (16) into hole in landing gear strap fitting. Install Forward Mounting Beam (12) using two bolts (14) with washers (15), threaded into barrel nuts.
3. Torque AN6 bolts to 95 - 110 in-lbs (1.1 – 1.2 m-daN).

4. At aft attachment fittings, push lugs on top of Aft Mounting Beam (22) into 12 jaw fittings on both aft attachment fittings. Slide ring on 12 jaw fittings down to lock mounting beam to attachment fittings. Ensure lugs are correctly seated in 12 jaw fittings.
5. Install two Lock Ring Assembly (24) on 12 jaw fittings to secure fitting closed.
6. Install two Brace (25) on outboard lugs of mounting beam and aft attachment fittings using two bolts (26) with washers (27).
7. Torque AN4 bolts to 30 - 40 in-lbs (3.4 – 4.5 m-N).

25-5 BASKET REMOVAL

Refer to Figure 25.5 and Figure 25.6.

1. Pull knob at bottom end of forward beam and lift basket until attachment fittings are free of keyways on forward beam.
2. Lift basket up and pull forward until lower aft attachment fitting is free of keyway. Rest forward end of basket on floor.
3. At aft end, slide basket forward and raise basket until upper aft attachment fitting is free of keyway.

25-6 BASKET INSTALLATION

Refer to Figure 25.5 and Figure 25.6.

1. Set basket upper aft attachment into upper keyway in aft beam. Forward end of basket may rest on floor.
2. Raise forward end of basket to forward beam and engage lower aft attachment into keyway on aft beam. Slide basket aft, and lift basket until lower attachment fitting hits stop over keyway in forward beam.
3. Push fitting into lower keyway, ensure top fitting enters top keyway, and slide basket down until locked. Pull up on forward end basket to ensure basket is locked in place.

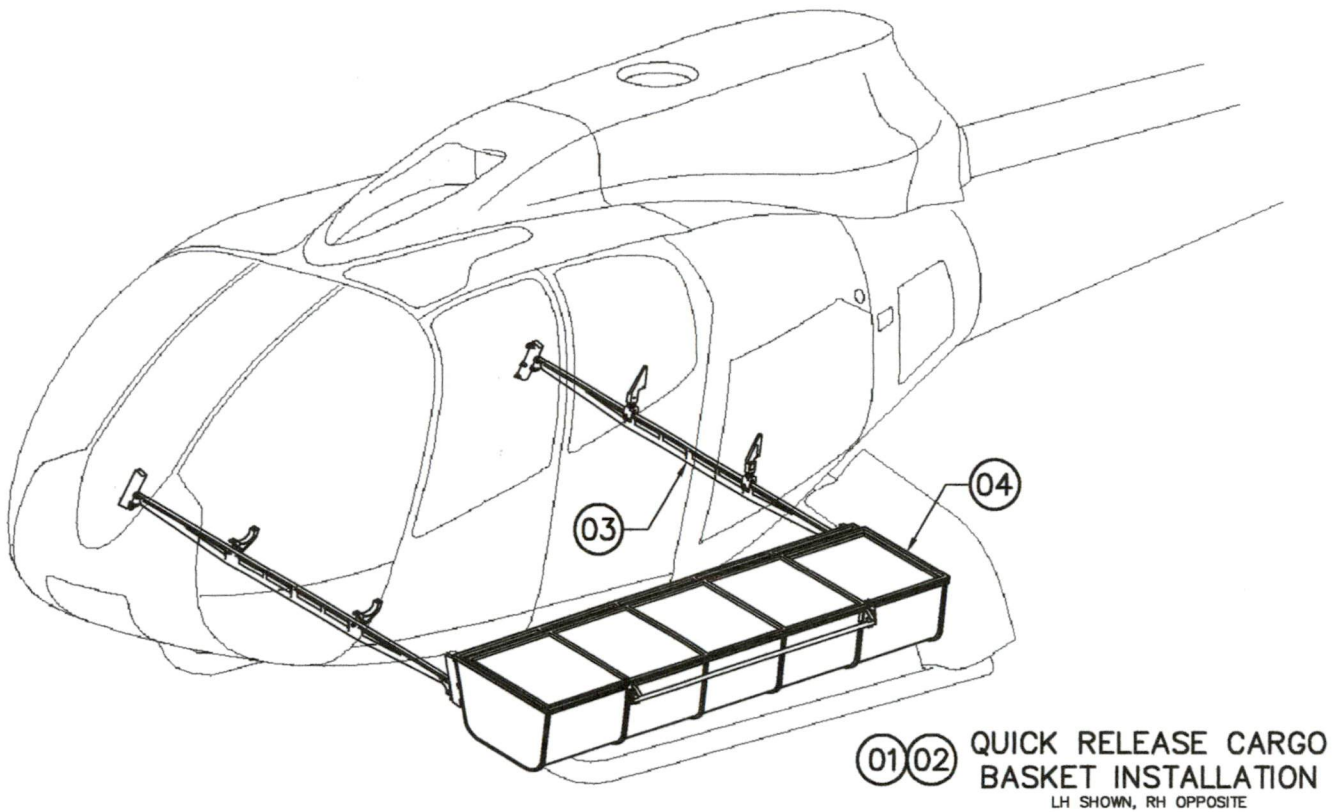


Figure 25.5 – Basket Attachment

Item	Qty.	Part Number	Description
01		100901-01-01	LH Basket Installation
02		100901-01-02	LH Basket Installation
03	. 1	100902-01	Quick Release Mounting Beams Installation
	. . 1	100902-11	Forward Beam Installation
	. . 1	100902-21	Aft Beam Installation
	. 1	100903-01	Attachment Fittings Installation
	. . 1	100903-11	Forward Attachment Fittings Installation
	. . 1	100903-21	Aft Attachment Fittings Installation
04	. 1	100910-01	Cargo Basket Assembly

Table 25.5 – Bill of Materials

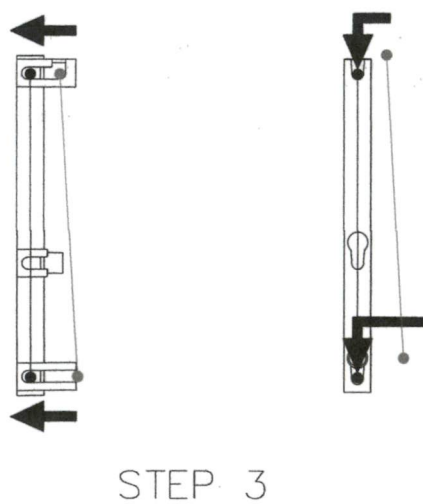
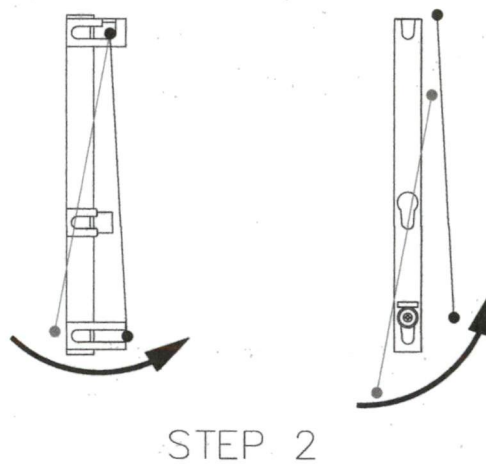
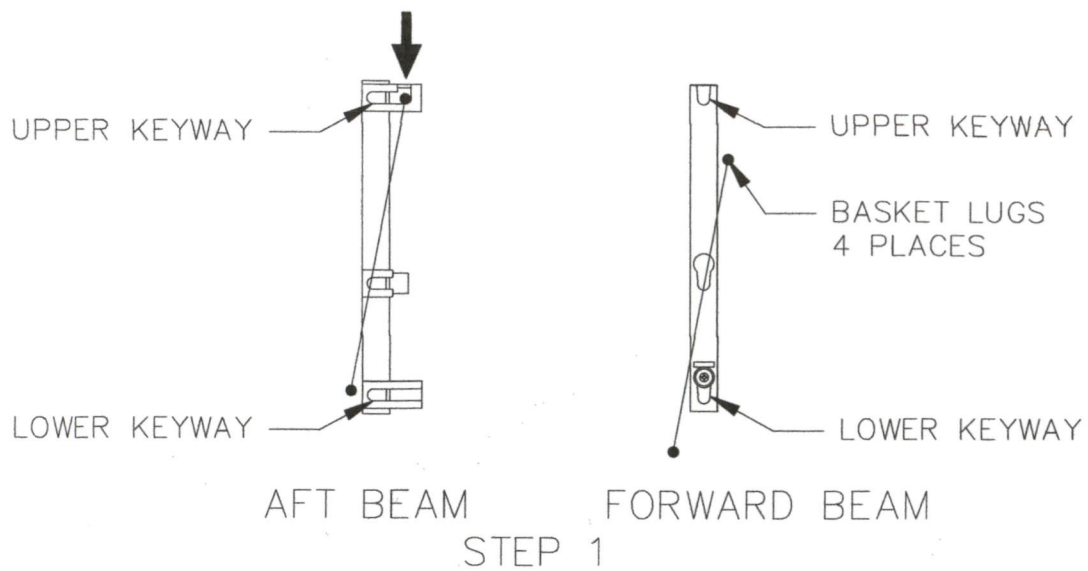


Figure 25.6 – Basket Attachment Steps

25-7 HANDLE BRACKET REPLACEMENT

Refer to Figure 25.7.

1. Remove two (2) AN3-11A Bolts, NAS1149F0363P Washers and MS21044N3 Nuts from each Handle Bracket (84267-01). Remove handle brackets from basket hoops.
2. Slide two (2) replacement Handle Brackets (84267-01) onto basket hoops. Align Handle Bracket to bushings in hoop. Insert two (2) AN3-11A Bolts with NAS1149F0363P Washers through Handle Bracket and bushing. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

25-8 HANDLE SPRING REPLACEMENT

Refer to Figure 25.7.

1. Remove two (2) AN3-12A Bolts, NAS1149F0363P Washers (2) and MS21044N3 Nuts attaching handle to lid. Remove handle from basket. Remove springs from handle.
2. Slide replacement 36278-01R and 36278-01L Springs onto handle. Spring arm will catch on hook when on the correct side. Insert two 36275-01 bushings into handle attachments. Locate handle on basket, and insert two (2) AN3-12A Bolts with NAS1149F0363P Washers through bracket on lid and bushing in handle. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m). Lift spring arm over catch on handle and bar on lid bracket.

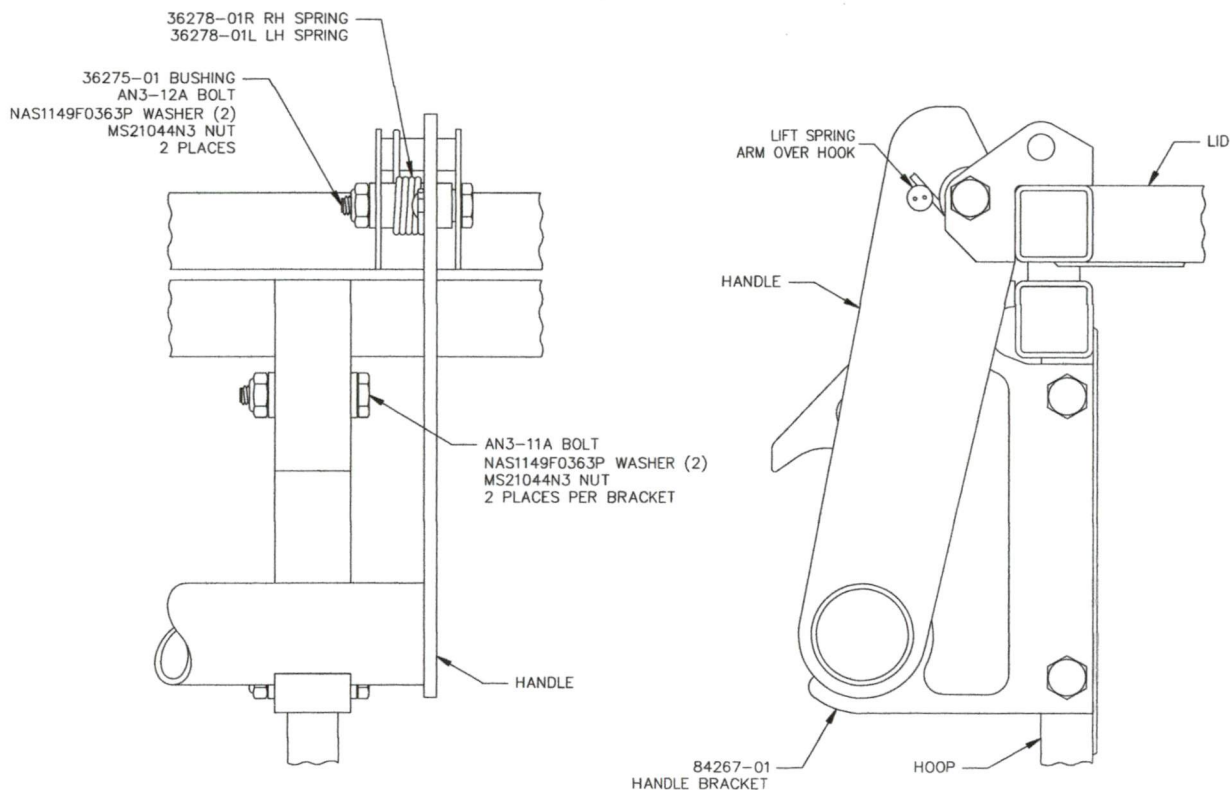


Figure 25.7 – Handle Bracket Parts

25-9 LID PROP REPLACEMENT

1. Remove AN3-15A and AN3-17A Bolts, NAS1149F0363P Washers (3), AN970-3 Washers (2) and MS21044N3 Nuts attaching lid prop to basket assembly. Remove lid prop from basket
2. Locate replacement 84280-01 Lid Prop on bushings at forward end of basket and lid.
3. Insert AN970-3 Washer into lid end of prop, and slide AN3-15A Bolt with NAS1149F0363P Washer through bushing in lid. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
4. Slide AN3-17A Bolt with AN970-3 Washer through bushing in basket. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
5. Ensure lid prop is seated on bushings and torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

25-10 QUICK RELEASE PIN SPRING REPLACEMENT

1. Remove basket from mounting beams, refer to section 25-5.
2. At lower attachment keyway on forward beam, remove MS21044C3 Nut from #10-32 stainless steel countersunk screw and remove 69830-13 Knob, 69830-12 Stop, and 69830-23 Spring. Discard defective Spring.
3. Place 69830-12 Stop on #10-32 stainless steel countersunk screw. Slide replacement 69830-23 Spring onto Stop. Insert screw/Stop/Spring into guide in lower keyway of aft beam. Install 69830-13 Knob and MS21044C3 Nut on inboard side of beam. Torque nut to 20-25 in-lbs (2.3-2.8 N-m).

25-11 WEIGHT AND BALANCE

This section contains weight and balance information for mounting provisions and cargo basket model 1009

Three weight and balance configurations are required: Attachment Fittings only (100903-01); Attachment Fittings and Mounting Beams (100902-01); and Cargo Basket Installed (100901-01-XX).

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
100903-01	Attachment Fittings Installation	3.0	104.98	312.83	0.00	0.00
100902-01	Mounting Beams Installation (including 100903-01)	46.0	102.21	4699.53	0.00	0.00
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	-56.90	-4267.50
100901-01-01	LH Cargo Basket Installation (total)	121.0	101.40	12267.03	-35.27	-4267.50
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	56.90	4267.50
100901-01-02	RH Cargo Basket Installation (total)	121.0	101.40	12267.03	35.27	4267.50
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	-56.90	-4267.50
100910-01	Cargo Basket Assembly	75.0	100.90	7567.50	56.90	4267.50
100901-01 -01/-02	Dual Cargo Basket Installation (total)	196.0	101.21	19834.53	0.00	0.00

Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
100903-01	Attachment Fittings Installation	1.35	2666.39	3604.18	0.00	0.00
100902-01	Mounting Beams Installation (including 100903-01)	19.50	2591.21	50540.31	0.00	0.00
100910-01	Cargo Basket Assembly	34.02	2562.86	87187.13	-1445.26	-49166.98
100901-01-01	LH Cargo Basket Installation (total)	53.52	2573.19	137727.45	-918.60	-49166.98
100910-01	Cargo Basket Assembly	34.02	2562.86	87187.13	1445.26	49166.98
100901-01-02	RH Cargo Basket Installation (total)	53.52	2573.19	137727.45	918.60	49166.98
100910-01	Cargo Basket Assembly	34.02	2562.86	87187.13	-1445.26	-49166.98
100910-01	Cargo Basket Assembly	34.02	2562.86	87187.13	1445.26	49166.98
100901-01 -01/-02	Dual Cargo Basket Installation (total)	87.54	2569.18	224914.58	0.00	0.00

Table 25.1 – Weight and Balance

OPTIONS: If the basket includes any of the following options, include these corrections to the weight and balance data.

Standard Units

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
70406-01	Front End Cutout	-0.3	52.9	-15.9	56.9	-17.1
70405-01	Lid Step	7.4	100.9	746.7	56.9	421.1
70408-01	Hangar Wheel	0.8	55.3	44.2	56.9	45.5

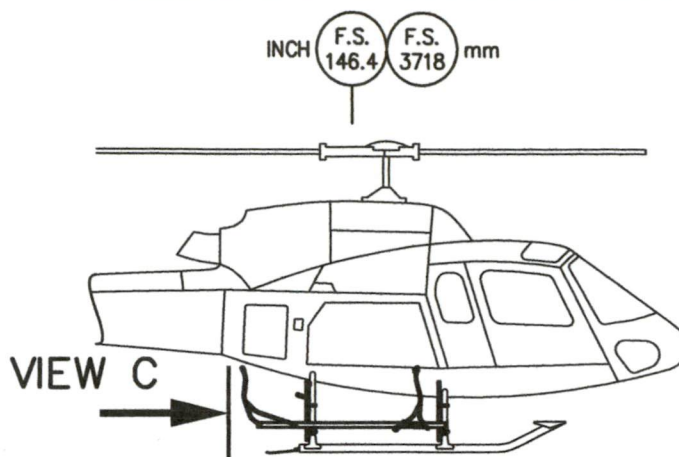
Metric Units

P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	Moment mm-kg	arm mm	moment mm-kg
70406-01	Front End Cutout	-0.1	1343.7	-182.8	1445.3	-196.7
70405-01	Lid Step	3.4	2562.9	8602.5	1445.3	4851.1
70408-01	Hangar Wheel	0.4	1404.6	509.7	1445.3	524.5

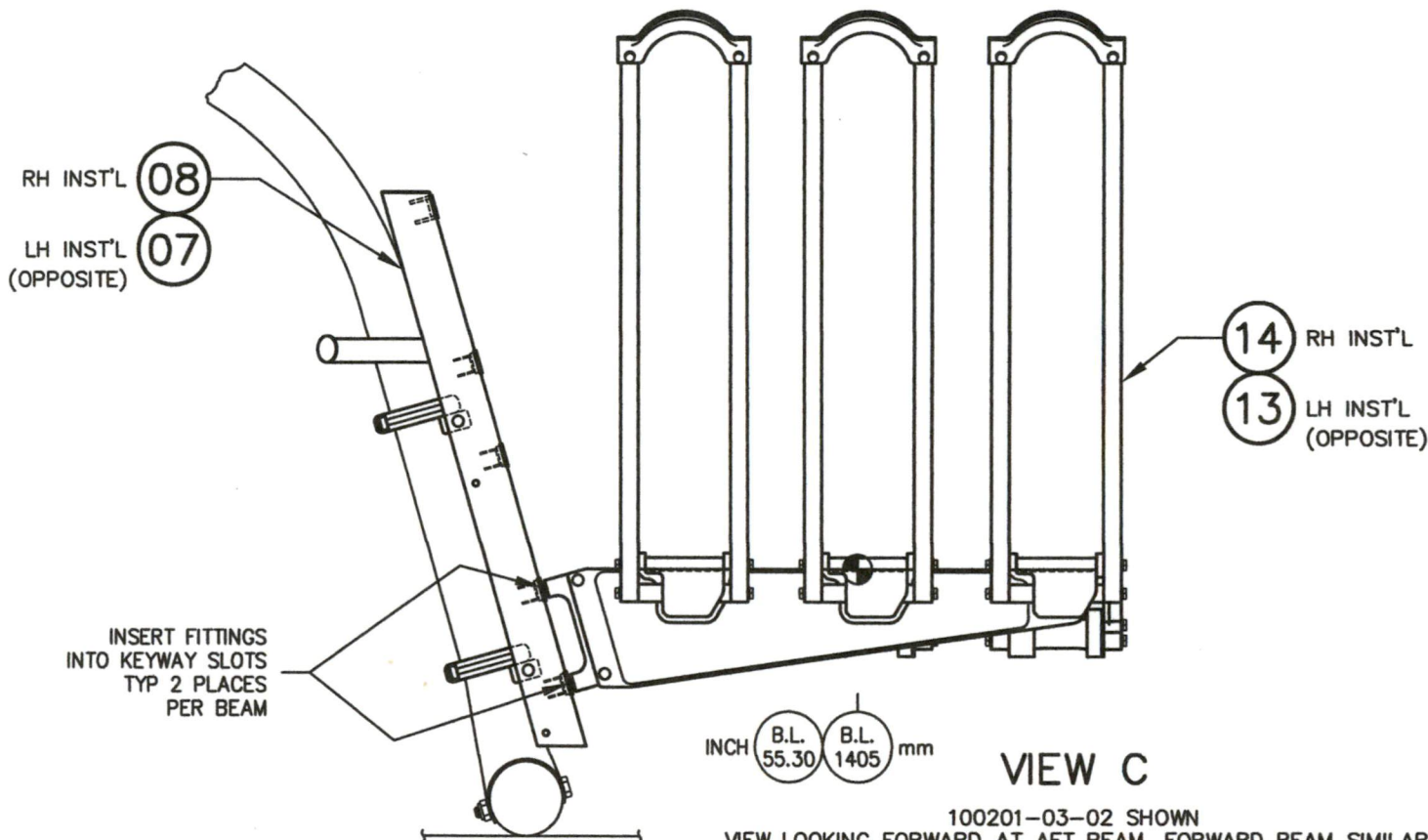
Table 25.2 – Options Weight and Balance

25-12 STRUCTURAL FASTENER DATA

Refer to Airbus Helicopters (Eurocopter) Standard Practices Manual for torque values not listed in this ICA.



- (06) BICYCLE RACK INSTALLATION – CARGO POD COMPATIBLE RH
 SHOWN
 (05) BICYCLE RACK INSTALLATION – CARGO POD COMPATIBLE LH
 OPPOSITE



100201-03-02 SHOWN
 VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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X.XX ±0.03	
X.X ±0.1	

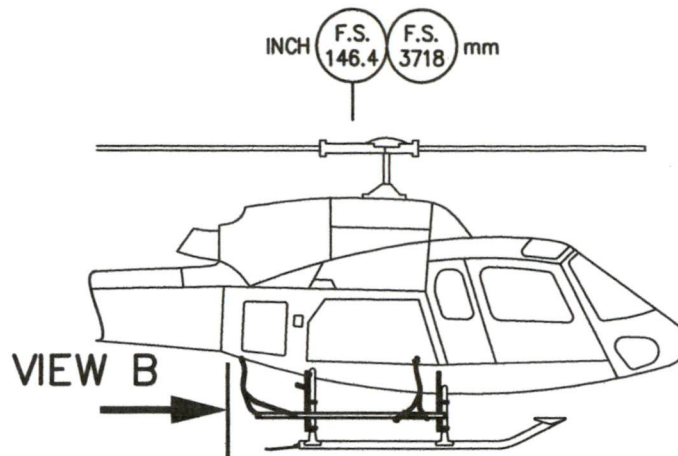


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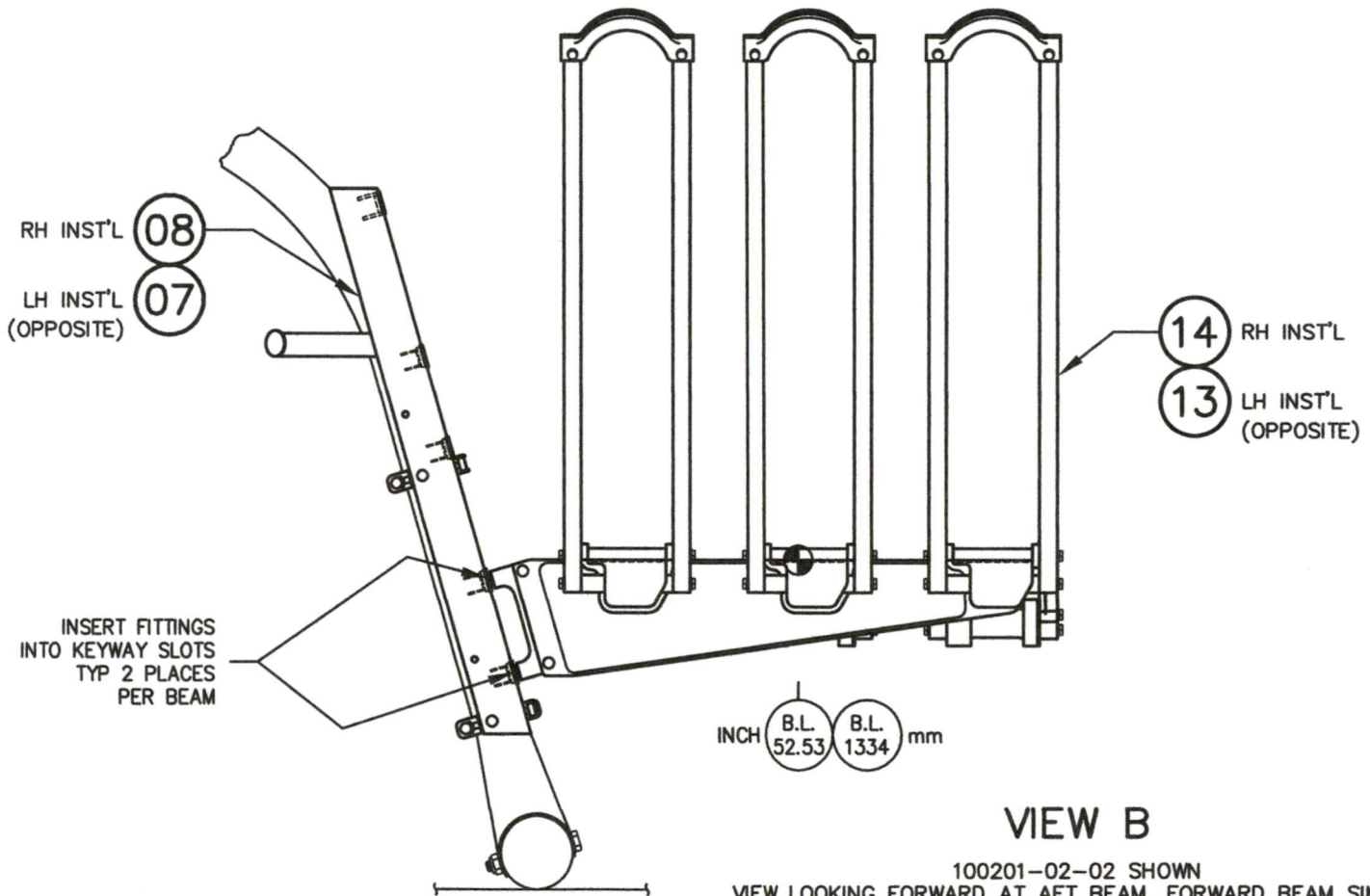
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AIRBUS HELICOPTERS AS350 & AS355 SERIES
 QUICK RELEASE BICYCLE RACK
 BICYCLE RACK INSTALLATION (POD COMPATIBLE)

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 3 OF 4	A4	100201	0



- (04) BICYCLE RACK INSTALLATION – HIGH RH
 SHOWN
 (03) BICYCLE RACK INSTALLATION – HIGH LH
 OPPOSITE



VIEW B

100201-02-02 SHOWN
VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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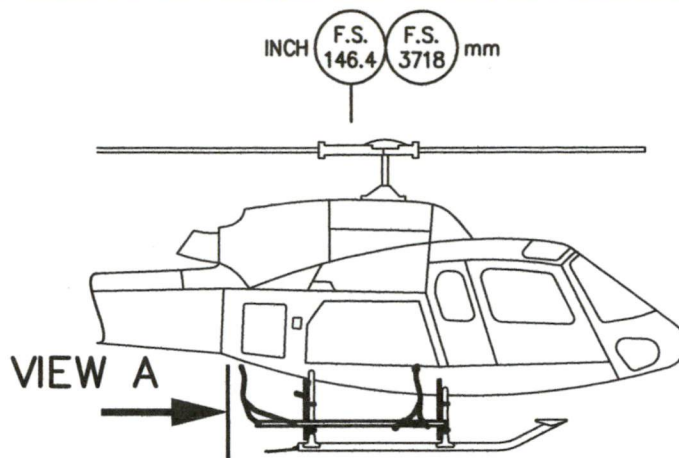


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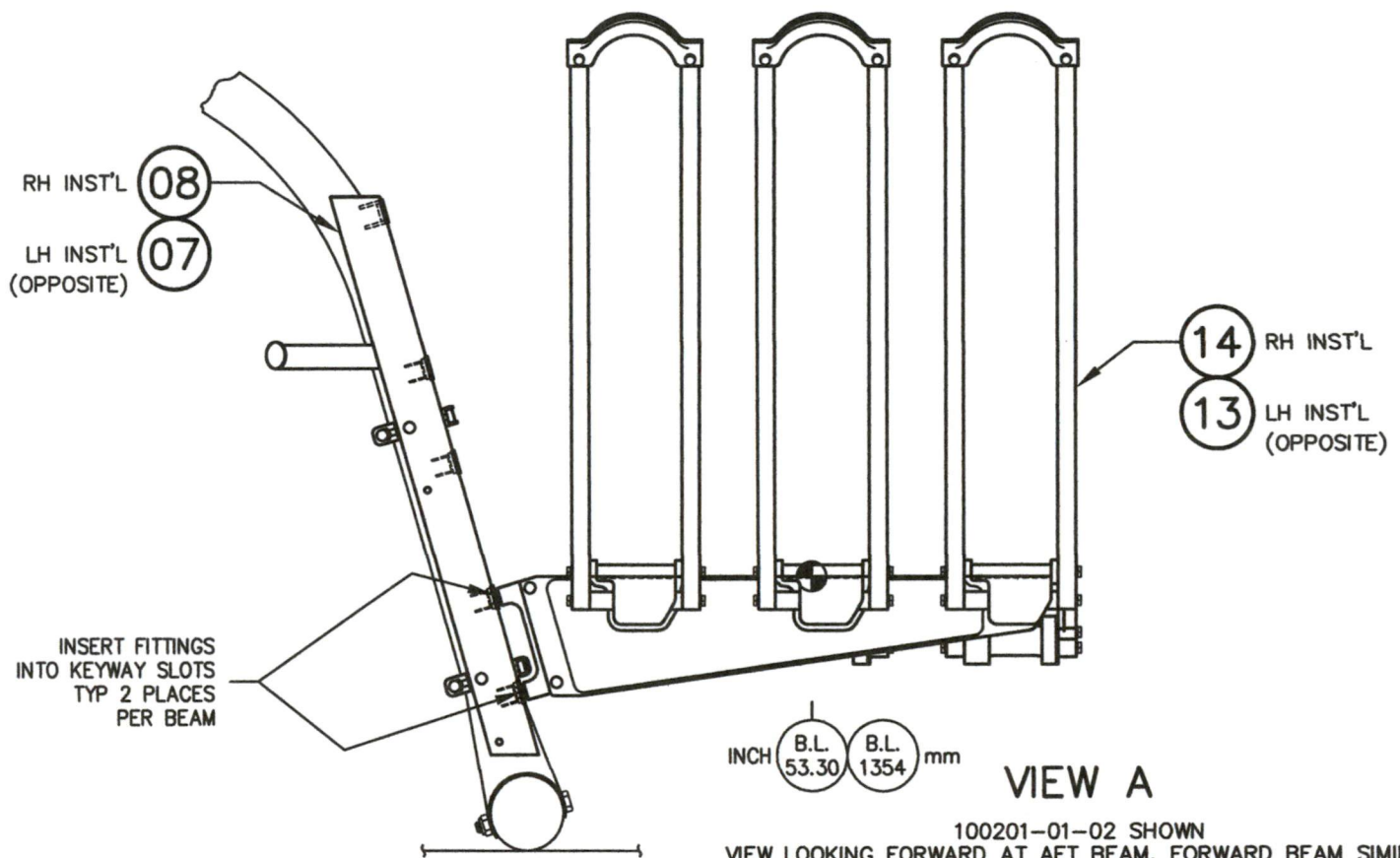
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AIRBUS HELICOPTERS AS350 & AS355 SERIES
 QUICK RELEASE BICYCLE RACK
 BICYCLE RACK INSTALLATION (HIGH)

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	
SHEET 2 OF 4	A4	100201	0	



- (02) BICYCLE RACK INSTALLATION – LOW RH
 SHOWN
 (01) BICYCLE RACK INSTALLATION – LOW LH
 OPPOSITE



100201-01-02 SHOWN
 VIEW LOOKING FORWARD AT AFT BEAM, FORWARD BEAM SIMILAR

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AIRBUS HELICOPTERS AS350 & AS355 SERIES

QUICK RELEASE BICYCLE RACK

BICYCLE RACK INSTALLATION (LOW)


NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 4	A4	100201	0

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES:

1. ATTACHMENT PROVISIONS INSTALLED IN ACCORDANCE WITH DRAWING 78602 (STANDARD CONFIGURATION) OR 78603 (CARGO POD COMPATIBLE CONFIGURATION) IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION.
2. SEE FLIGHT MANUAL SUPPLEMENT, FMS1002.91, FOR LIMITATIONS ON HELICOPTER OPERATIONS WITH BICYCLE RACK INSTALLED.
3. SEE INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA1002.90, FOR MAINTENANCE AND WEIGHT AND BALANCE INFORMATION.
4. BICYCLE RACK INSTALLATION IN HIGH AND LOW POSITIONS MAY NOT PROVIDE SUFFICIENT CLEARANCE OF BICYCLE HANDLE BARS FROM SIDE CARGO COMPARTMENT EXTENDERS (COMMONLY REFERRED TO AS SQUIRREL CHEEKS OR CARGO PODS). ROTATION OF HANDLE BARS MAY BE REQUIRED.

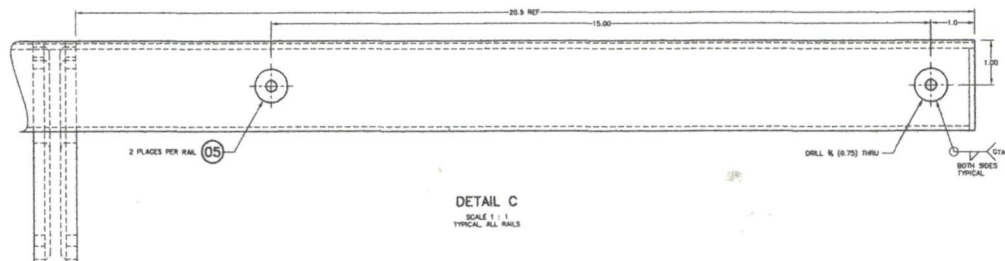
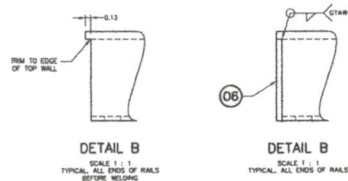
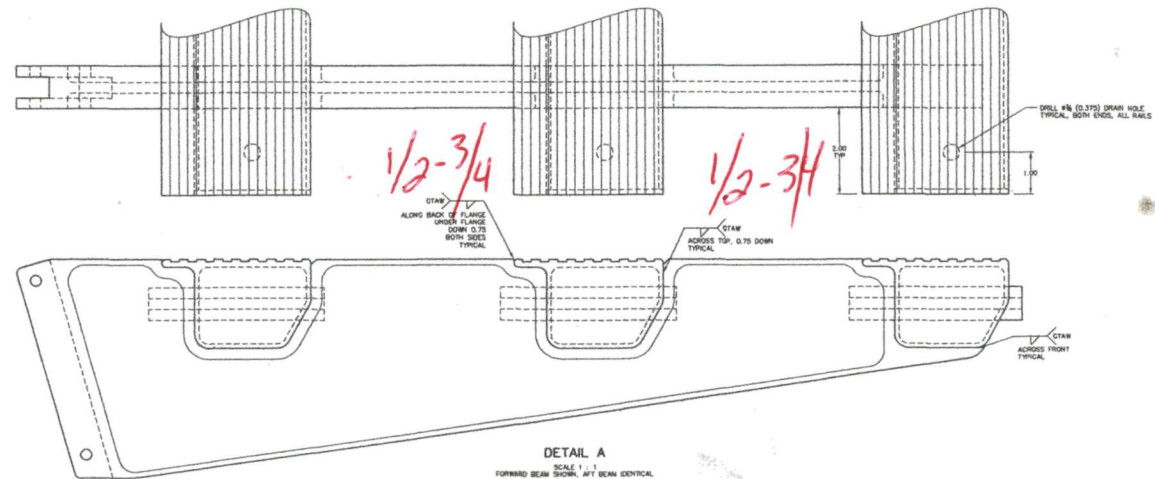
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	1					78603-01-02	11	ATTACHMENT PROVISIONS INSTALLATION (CARGO POD COMPATIBLE - LH)
		1				78602-02-01	10	ATTACHMENT PROVISIONS INSTALLATION (HIGH - RH)
			1			78602-02-02	09	ATTACHMENT PROVISIONS INSTALLATION (HIGH - LH)
				1		78602-01-01	08	ATTACHMENT PROVISIONS INSTALLATION (LOW - RH)
					1	78602-01-02	07	ATTACHMENT PROVISIONS INSTALLATION (LOW - LH)
						100201-03-02	06	BICYCLE RACK INSTALLATION (CARGO POD COMPATIBLE - RH)
						100201-03-01	05	BICYCLE RACK INSTALLATION (CARGO POD COMPATIBLE - LH)
						100201-02-02	04	BICYCLE RACK INSTALLATION (HIGH - RH)
						100201-02-01	03	BICYCLE RACK INSTALLATION (HIGH - LH)
						100201-01-02	02	BICYCLE RACK INSTALLATION (LOW - RH)
						100201-01-01	01	BICYCLE RACK INSTALLATION (LOW - LH)
06	05	04	03	02	01	PART NO.	ITEM	DESCRIPTION
QTY	QTY	QTY	QTY	QTY	QTY	LIST OF MATERIALS		

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	AIRBUS HELICOPTERS AS350 & AS355 SERIES QUICK RELEASE BICYCLE RACK BICYCLE RACK INSTALLATION				
	NOT TO SCALE SHEET 4 OF 4		DWG. SIZE A4	DWG. NO. 100201	

measured @ Flange

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF 6061 ALUMINUM TO BE COMPLETED BY GTAW METHOD TO AWS2089C. WELDING ROD SHALL CONFORM TO AWS/AWS ER4043.
3. FINISH ALUMINUM PARTS - AFTER WELDING:
THOROUGHLY DEGREASE, ALDINE, EPOXY PRIME AND POLYURETHANE PAINT.
ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT.



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measured @ flange



1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF 6061 ALUMINUM TO BE COMPLETED BY GTAW METHOD TO AMS2855C. WELDING ROD SHALL CONFORM TO AWS/AWS ER4043.
3. FINISH ALUMINUM PARTS - AFTER WELDING:
 - THOROUGHLY DEGREASE, ALDINE, EPOXY PRIME AND POLYURETHANE PAINT.
 - ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT.
 - APPLY RANDOLPH X-1567 BINGWALK GRIP PAINT OR EQUIVALENT TO TOP OF INBOARD RAIL, FORWARD OF ADAPTER BEAM ONLY.

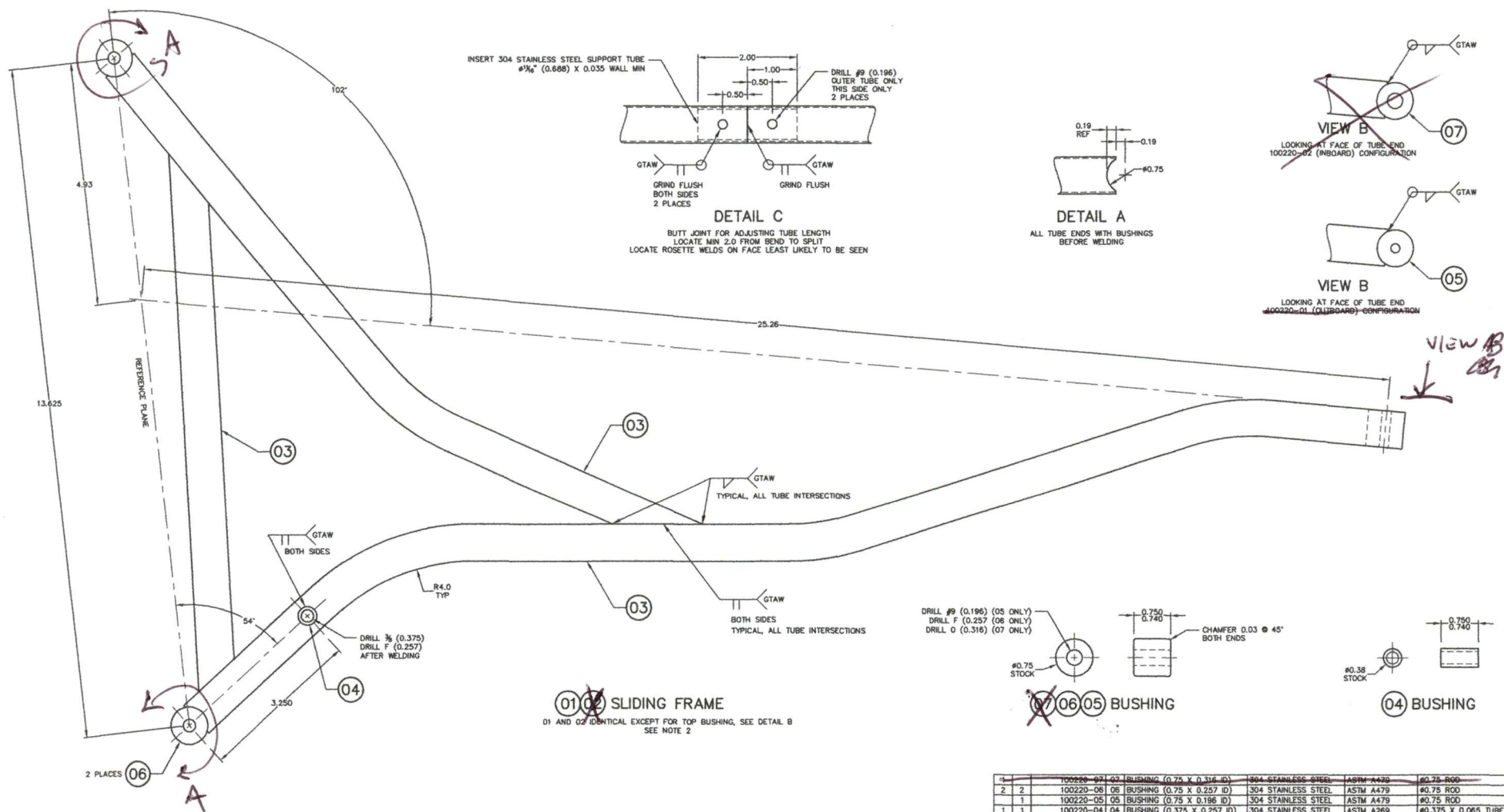


DETAIL 8

SCALE 1 : 1
FORWARD BEAM SHOWN, AFT BEAM SIMILAR

[illegible]

THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THE DRAWING OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR ABUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED HEREIN.			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



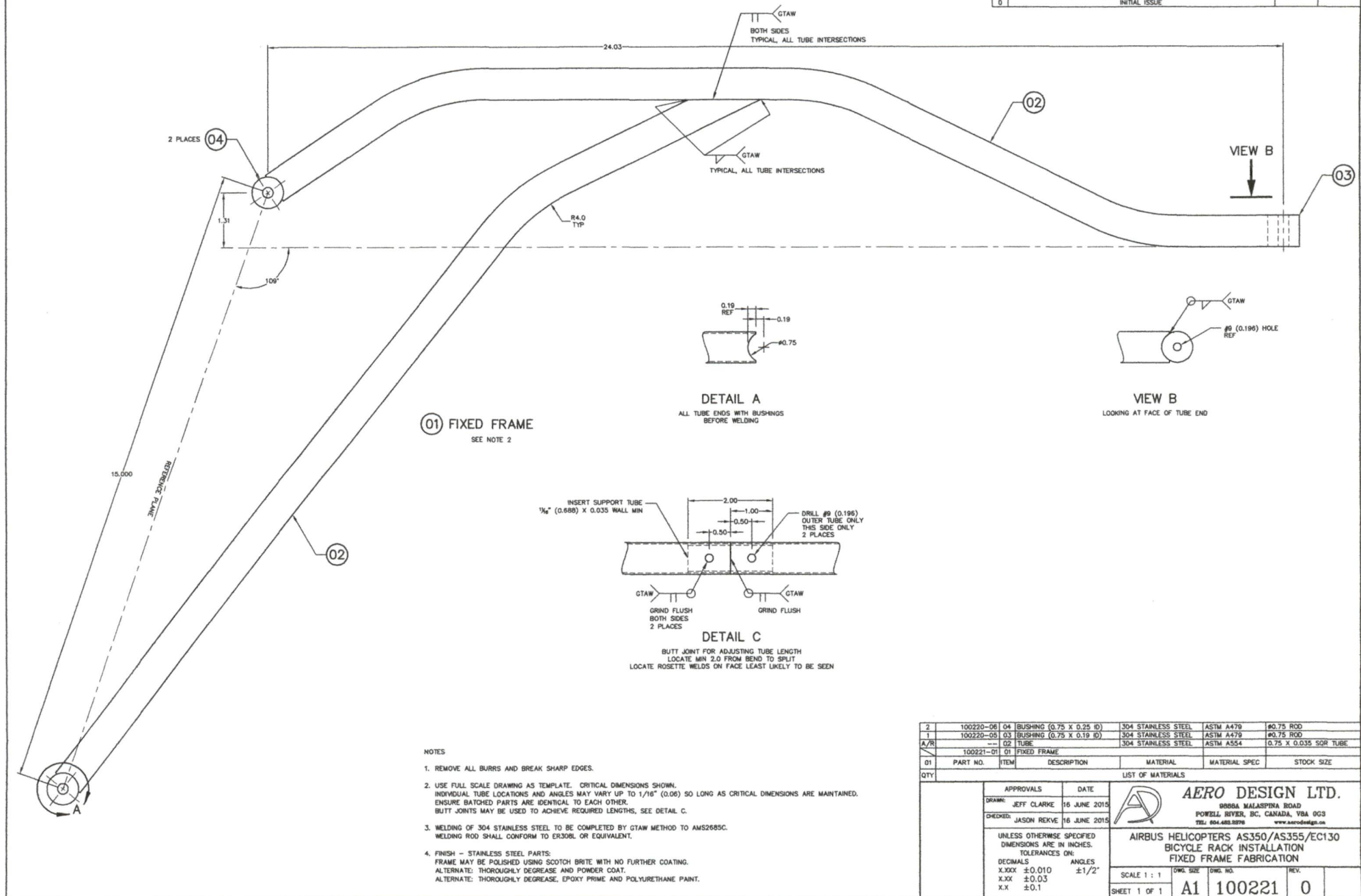
NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. USE FULL SCALE DRAWING AS TEMPLATE. CRITICAL DIMENSIONS SHOWN. INDIVIDUAL TUBE LOCATIONS AND ANGLES MAY VARY UP TO 1/16" (0.06) SO LONG AS CRITICAL DIMENSIONS ARE MAINTAINED. ENSURE BATCHED PARTS ARE IDENTICAL TO EACH OTHER. BUTT JOINTS MAY BE USED TO ACHIEVE REQUIRED LENGTHS, SEE DETAIL C.
3. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2885C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.
4. FINISH - STAINLESS STEEL PARTS: FRAME MAY BE POLISHED USING SCOTCH BRITE WITH NO FURTHER COATING. ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT. ALTERNATE: THOROUGHLY DEGREASE, EPOXY PRIME AND POLYURETHANE PAINT.

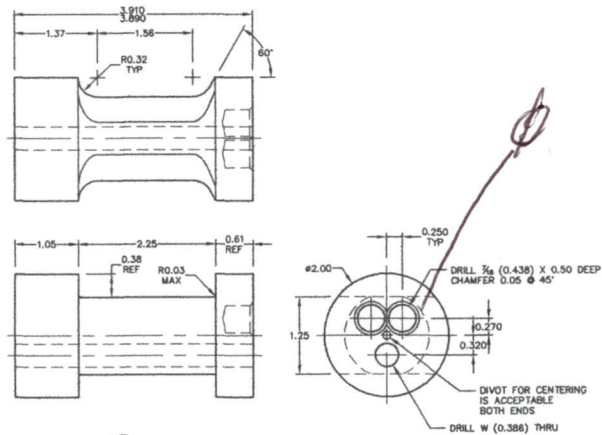
QTY	QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
1	1	100220-01	01	SLIDING FRAME (INBOARD)	304 STAINLESS STEEL	ASTM A420	#0.75 ROD
2	2	100220-02	02	SLIDING FRAME (OUTBOARD)	304 STAINLESS STEEL	ASTM A420	#0.75 ROD
1	1	100220-03	03	TUBE	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-04	04	BUSHING (0.375 X 0.257 ID)	304 STAINLESS STEEL	ASTM A269	#0.375 X 0.065 TUBE
1	1	100220-05	05	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-06	06	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-07	07	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-08	08	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-09	09	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-10	10	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-11	11	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-12	12	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-13	13	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-14	14	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-15	15	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-16	16	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-17	17	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-18	18	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-19	19	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-20	20	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-21	21	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-22	22	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-23	23	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-24	24	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-25	25	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-26	26	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-27	27	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-28	28	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-29	29	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-30	30	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-31	31	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-32	32	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-33	33	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-34	34	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-35	35	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-36	36	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-37	37	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-38	38	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-39	39	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-40	40	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-41	41	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-42	42	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-43	43	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-44	44	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-45	45	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-46	46	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-47	47	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-48	48	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-50	50	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-51	51	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-53	53	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-54	54	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-55	55	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-56	56	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-58	58	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-62	62	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-75	75	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-77	77	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-78	78	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-80	80	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-81	81	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-82	82	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-83	83	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-84	84	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-85	85	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-86	86	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
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1	1	100220-95	95	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-96	96	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-97	97	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-98	98	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-99	99	BUSHING (0.75 X 0.196 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD
1	1	100220-100	100	BUSHING (0.75 X 0.257 ID)	304 STAINLESS STEEL	ASTM A479	#0.75 ROD

APPROVALS				DATE			
DRAWN: JEFF CLARKE				16 JUNE 2015			
CHECKED: JASON REKVE				16 JUNE 2015			
UNLESS OTHERWISE SPECIFIED				DIMENSIONS ARE IN INCHES.			
TOLERANCES ON:				DECIMALS			
X.XXX				±0.010			
X.XX				±0.03			
X.X				±0.1			
ANGLES				±1/2°			
SCALE 1 : 1				SHEET 1 OF 1			
A1				100220			
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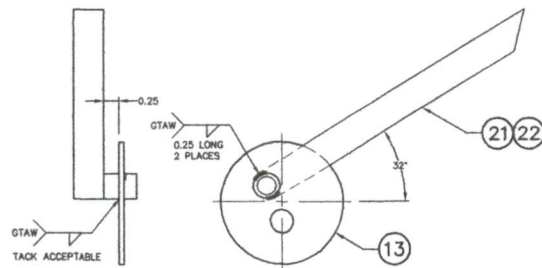
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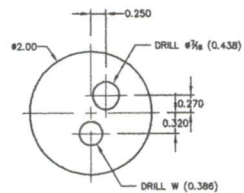
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0	INITIAL ISSUE		



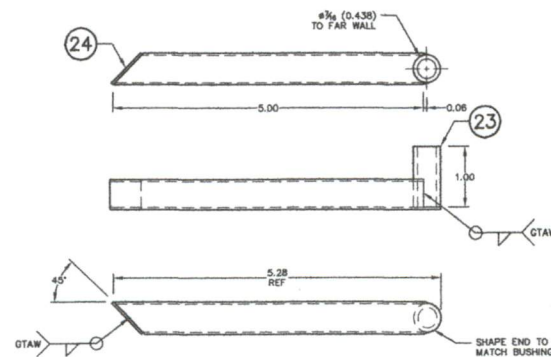
③ CAM



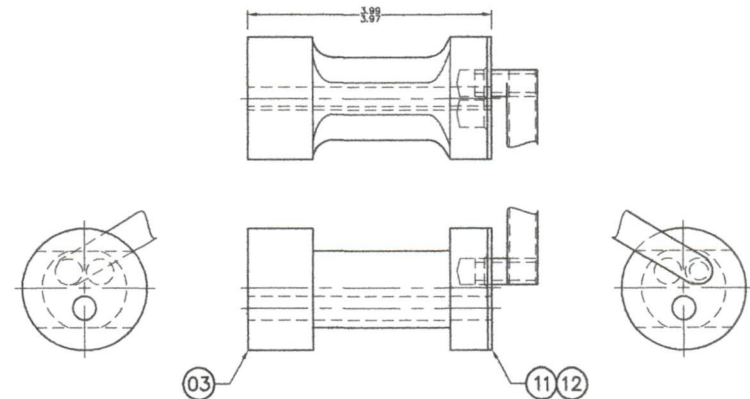
⑪⑫ DRIVE PLATE ASSEMBLY
LH SHOWN, RH OPPOSITE



⑬ DRIVE PLATE




(21)(22) HANDLE ASSEMBLY
LH SHOWN, RH OPPOSITE



0102 CAM ASSEMBLY
LH SHOWN, RH OPPOSITE

[illegible]

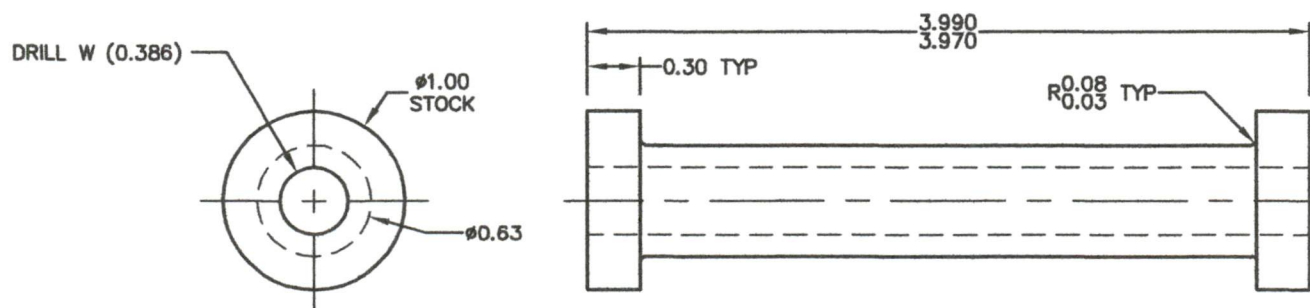
APPROVALS DATE		 AERO DESIGN LTD. 8085A MALASPINA ROAD POWELL, BEVEL, BC, CANADA, V8A 6G3 TEL: 250-488-5275 www.aerodesign.ca	
DRAWN: CHECKED:	JEFF CLARKE ALISON REKVE	05 JUNE 2015 16 JUNE 2015	AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION CAM FABRICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1			
SCALE 1 : 1 SHEET 1 OF 1		DIM. SIZE A1	DIM. NO. 100222
			REV. 0

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0	INITIAL ISSUE		

NOTES


1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



01 UPPER ROLLER

		100223-02	02	LOWER ROLLER	BLACK ACETAL	ASTM D6778	1.0 ROD
		100223-01	01	UPPER ROLLER	BLACK ACETAL	ASTM D6778	1.0 ROD
02	01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

QTY	QTY	LIST OF MATERIALS				
-----	-----	-------------------	--	--	--	--

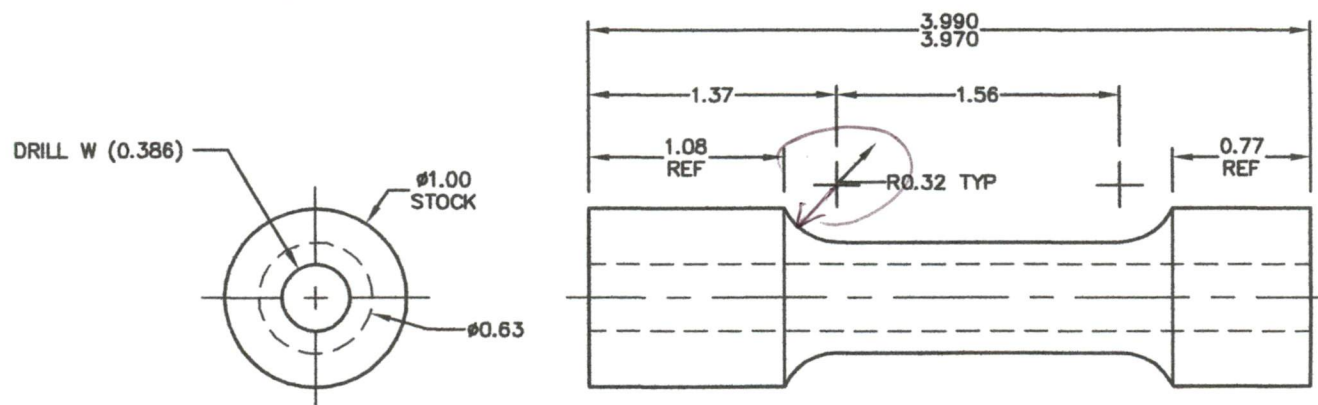
	APPROVALS		DATE			AERO DESIGN LTD.						
	DRAWN: JEFF CLARKE		05 JUNE 2015			9888A MALASPINA ROAD						
	CHECKED: JASON REKVE		16 JUNE 2015			POWELL RIVER, BC, CANADA, V8A 0G3						
					TEL: 604.483.2376							
					www.aerodesign.ca							
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1					AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION ROLLER FABRICATION							
					SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.	
					SHEET 1 OF 2		A4		100223		0	

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0	INITIAL ISSUE		

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



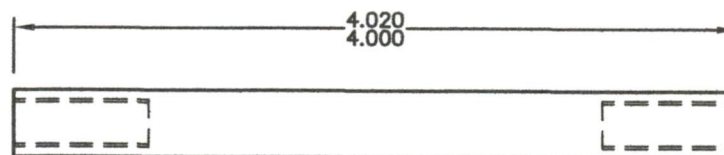
02 LOWER ROLLER

		100223-02	02	LOWER ROLLER	BLACK ACETAL	ASTM D6778	1.0 ROD
		100223-01	01	UPPER ROLLER	BLACK ACETAL	ASTM D6778	1.0 ROD
02	01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	QTY	LIST OF MATERIALS					
				APPROVALS	DATE	 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 804.483.2376 www.aerodesign.ca	
				DRAWN: JEFF CLARKE	05 JUNE 2015		
				CHECKED: JASON REKVE	16 JUNE 2015		
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION ROLLER FABRICATION	
				SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
				SHEET 2 OF 2	A4	100223	0

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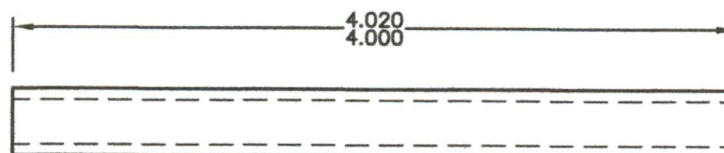
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

TAP DRILL $1\frac{7}{64}$ (0.266) X 0.75 DEEP
TAP FOR 1/4-28 HELICOIL
INSTALL 3591-4CN375 HELICOIL
BOTH ENDS



② BUSHING

DRILL F (0.257)




① BUSHING

NOTES

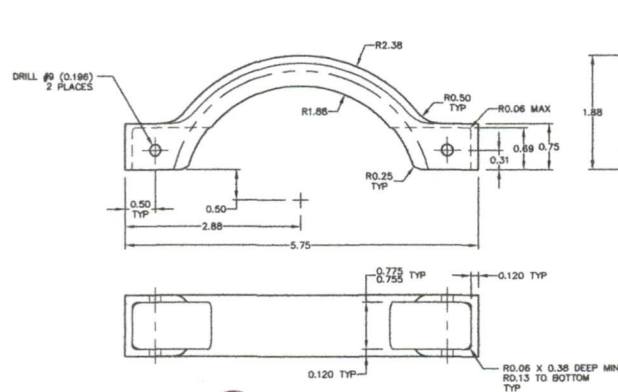
1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

2		3591-4CN375		SELF-LOCKING HELICOIL			
		100224-02	02	BUSHING	304 STAINLESS STEEL	ASTM A479	0.375 ROD
		100224-01	01	BUSHING	304 STAINLESS STEEL	ASTM A269	0.375 X 0.065 TUBE
02	01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

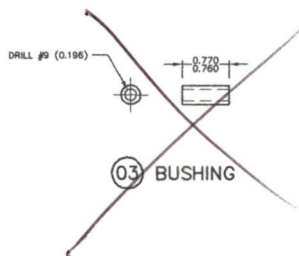
QTY	QTY	LIST OF MATERIALS					
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		APPROVALS	DATE	 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 804.483.2376 www.aerodesign.ca			
		DRAWN: JEFF CLARKE	15 JUNE 2015				
		CHECKED: JASON REKVE	16 JUNE 2015				
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION BUSHING FABRICATION			
				SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
				SHEET 1 OF 1	A4	100224	0

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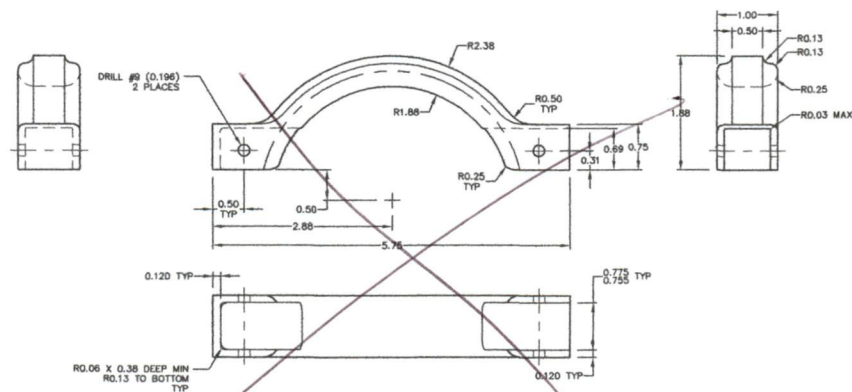
02 FIXED STRAP



03 BUSHING

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. FINISH - ALUMINUM PARTS:
THOROUGHLY DEGREASE AND POWDER COAT.
ALTERNATE: THOROUGHLY DEGREASE, ALODINE, EPOXY PRIME AND POLYURETHANE PAINT.
ALTERNATE: ANODIZE IN ACCORDANCE WITH MIL-A-8623F, TYPE II.



01 SWING STRAP

Not Required

100225-03	03 BUSHING	360 BRASS	ASTM B16	5/16 ROD	
100225-02	02 FIXED STRAP	6061-T6 ALUMINUM	QQ-A-200/8	2 X 1 BAR	
100225-01	01 SWING STRAP	6061-T6 ALUMINUM	QQ-A-200/8	2 X 1 BAR	
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS				

APPROVALS		DATE		AERO DESIGN LTD.	
DRAWN: JEFF CLARKE		06 JUNE 2015		8088A MALASPINA ROAD	
CHECKED: JASON REKVE		16 JUNE 2015		POWELL RIVER, BC, CANADA, V8A 0G3	
				TEL: 604.685.8876 www.aerodesign.ca	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:			AIRBUS HELICOPTERS AS350/AS355/EC130		
DECIMALS			BICYCLE RACK INSTALLATION		
ANGLES			STRAP FABRICATION		
X.XXX ±0.010			SCALE 1 : 1		
X.XX ±0.03			DWG. NO.		
X.X ±0.1			REV.		
			SHEET 1 OF 1		
			A1 100225 0		

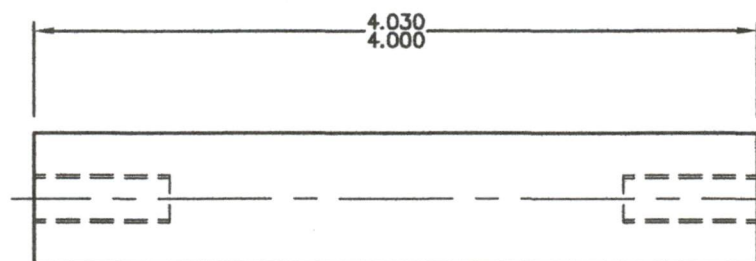
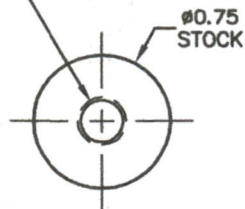
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0	INITIAL ISSUE		

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.


TAP DRILL $1\frac{1}{4}$ (0.266) X 0.75 DEEP
TAP FOR 1/4-28 HELICOIL
INSTALL 3591-4CN375 HELICOIL
BOTH ENDS



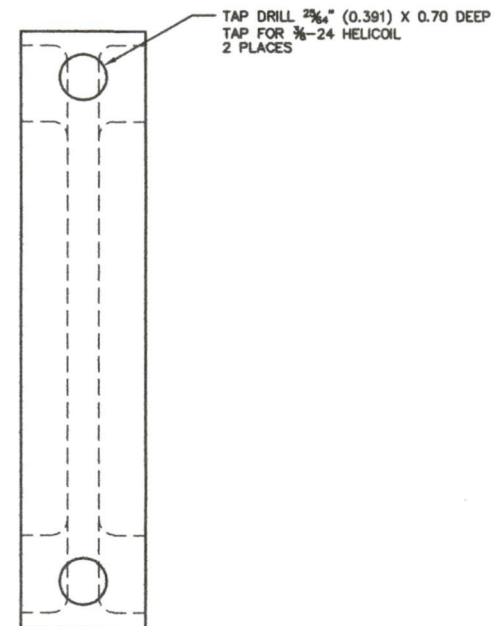
FRAME

01 RACK BUSHING

2	3591-4CN375	02	SELF-LOCKING HELICOIL			
	100226-01	01	RACK BUSHING	6061-T6 ALUMINUM	QQ-A-200/8	0.75 ROD
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					

	APPROVALS	DATE	 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca
	DRAWN: JEFF CLARKE	15 JUNE 2015	
	CHECKED: JASON REKVE	16 JUNE 2015	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1			AIRBUS HELICOPTERS AS350/AS355/EC130 BICYCLE RACK INSTALLATION RACK BUSHING FABRICATION
SCALE 1 : 1 SHEET 1 OF 1			DWG. SIZE A4
			DWG. NO. 100226
			REV. 0

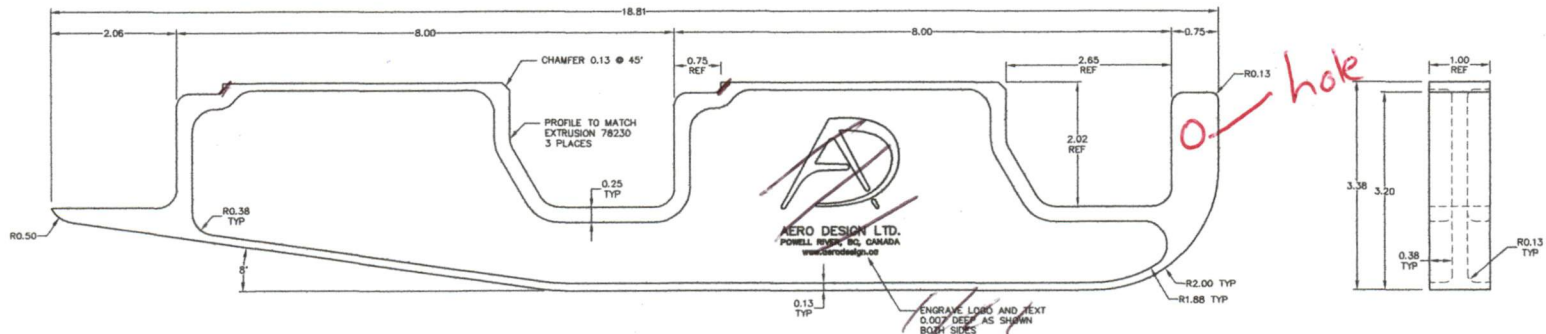
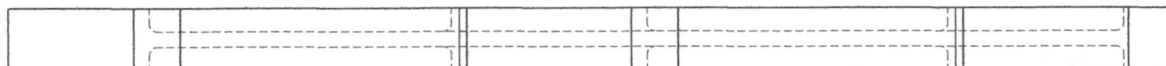
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



PART TO BE CNC MACHINED USING THIS DRAWING AS A TEMPLATE

100231-01		01 FORWARD BRACKET		8061-T8 ALUMINUM		QQ-A-200/8		1 X 6 FLAT BAR	
01	PART NO.	ITEM	DESCRIPTION	MATERIAL		MATERIAL SPEC		STOCK SIZE	
QTY		LIST OF MATERIALS							
APPROVALS DRAWN: JEFF CLARKE 12 JUNE 2015 CHECKED: JASON REKVE 16 JUNE 2015				 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.453.2376 www.aerodesign.ca					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				AIRBUS HELICOPTERS EC130 BICYCLE RACK INSTALLATION FORWARD BRACKET					
SCALE 1 : 1 SHEET 1 OF 1				DWG. SIZE A3		DWG. NO. 100231		REV. 0	


REV.		DESCRIPTION OF CHANGE	INITIALS	DATE
0		INITIAL ISSUE		



01 FORWARD ADAPTER BEAM
PART TO BE CNC MACHINED USING THIS DRAWING AS A TEMPLATE

Remove engraving or resize

- NOTES
1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

100232-01		01	FORWARD ADAPTER BEAM		6061-T6 ALUMINUM	QQ-A-200/8	3.5 X 1 FLAT BAR	
QTY	PART NO.	ITEM	DESCRIPTION		MATERIAL	MATERIAL SPEC	STOCK SIZE	
					LIST OF MATERIALS			
APPROVALS			DATE		 <div>AERO DESIGN LTD. 8080A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.480.8276 www.aerodesign.ca</div>			
DRAWN:		JEFF CLARKE		12 JUNE 2015				
CHECKED:		JASON REKVE		16 JUNE 2015				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:					AIRBUS HELICOPTERS EC130 BICYCLE RACK INSTALLATION FORWARD ADAPTER BEAM			
DECIMALS		ANGLES						
X.XXX ±0.010		±1/2°						
X.XX ±0.03								
X.X ±0.1								
SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.		
SHEET 1 OF 1		A1		100232		0		

Wings Engineering Limited
Review Notes
For
Aero Design Ltd.
Engineering Report; ER1002.05-0-12Jul2015
Airbus Helicopters EC130B4
Quick Release Bike Rack, Compliance Report

1. Cover Page

Reads "EC130 B4" vs. CP1002 "AS350 & AS355 All Models" and "EC130 B4"
i.e.; Change to match CP. → only applies to EC130 B4

2. 2.0 Reference Text

ER1009.01, Revision 0, dated XX has not been approved yes by DAR 304 ✓

TR1009.02, Revision 0, dated XX DAR review pending ✓

Aero Design Ltd. Installation Drawings:

Need copies of
100201, Revision 0 – Bicycle Rack Installation should be 100202, provided 17/7/15

Aero Design Ltd. Fabrication Drawings:

Need copies of
100211, Revision 0 – Bike Rack Assembly
100215, Revision 0 – Forward Frame Assembly
100235, Revision 0 – Attachment Bracket Fabrication } send

3. 4.1 Load Factors

Not at bottom of page. Should read "Racks"? ✓

4. 4.2 Loads Overview

Please note 2 - 40 lb Bikes and 1 - 50 lb Bike Outbrd

The drag loads look excessive especially the rack.

I would prefer to see a loads summary.

5. 4.4.1 Drag Load

How does the rack present 1.4 ft² frontal area? Confirmed. 206 in² = 1.4 sq. ft
i.e.; Frontal frame area is only the max area in a single plane.

However if a Mountain Bike has a 1.5 ft² area the 1.4 ft² Rack area looks reasonable. ✓

and Rack Cd = 1.5 max for Open Frame, Rounded Edges per Hdbk pages → check
looks conservative wrt the Mountain Bike's Cd = 1.1

Bike design drag is at Vd = 110 kias FMS Vne * 1.11 Vd/Vne = 122.1 kts = 206.1 ft/sec

Per Chart the area of a Perfect Bike (25 lbs?) = 1.2 ft² and Cd = 1.1

Check square/cube relationship
for volume vs area

Area 50 lb Mountain Bike = $1.2 * (50/25)^{.333} = 1.51 \text{ ft}^2$

Mnt Bike drag limit = $.00238 * 206^2 * 1.5 * 1.1/2 = 83.3 \text{ lbs}$

Mnt Bike drag ult = 1.5 Limit = 125.0 lbs

Sta/s and WL/s for the aerodynamic centers?

and explain how the vertical landing loads are more significant.

Mass = Volume

proportional increase $\rightarrow X$

$X^3 = 2M$

$X = \sqrt[3]{2M}$

6. 4.3.3 Sideward Emergency

You don't want to consider 2 @ 40 lbs and 1 @ 50 lbs?

If not please include a conservative note.

$A_2 = A_1 \cdot X^2$

7. 5.5 Sideward Emergency

At least $(40 + 40 + 50) * 2 = 260 \text{ lbs}$ shown with moment arm/s

Please show how these side loads are resolved.

$= \left(\sqrt[3]{2} \right)^2$
=

8. Figure 5.6.2

Please show Aft Beam Limit/Ult Wt.s. 121 lbs Ult?

$A_1 =$

$M_1 =$

square-cube law

$A_2 = A_1 (x^2)$

$V_2 = V_1 (x^3)$

$50 = 25 \cdot x^3$

$2 = x^3$

$x = \sqrt[3]{2}$

$A_2 = A_1 \left(\sqrt[3]{2} \right)^2$

$A_2 = A_1 \cdot 2^{2/3}$

$A_2 = A_1 \times 1.587$

$x = \text{proportional change}$

* Insert drag calcs.

Wings Engineering Limited
Review Notes
For
Aero Design Ltd.
Test Plan and Report; TR1002.06-0-14Jul2015
Airbus Helicopters EC130B4
Quick Release Bike Rack, Load Tests

1. Cover Page

Reads "EC130 B4" vs. CP1002 "AS350 & AS355 All Models" and "EC130 B4"

i.e.; **Change to match CP?** *Only applies to EC130 config*

Document header reads "TR1009.02"

i.e.; **Change to read "TR1002.06"**. ✓

2. 2.0 Reference Text

Aero Design Ltd. Installation Drawings:

Need copies of (same list as noted for the ER1002.05 Review)

100201, Revision 0 – Bicycle Rack Installation *Does not apply to this installation*

Aero Design Ltd. Fabrication Drawings:

Need copies of (same list as noted for the ER1002.05 Review)

100211, Revision 0 – Bike Rack Assembly

100215, Revision 0 – Forward Frame Assembly

100235, Revision 0 – Attachment Bracket Fabrication

*Drawing list updated
Send 100211/15*

3. 3.1 Combined Positive Maneuvering and Drag Load

Update with applicable changes from the ER1002.05 Review

4. 3.2 Negative Maneuvering Load

Are these tests just for Bike Mount?

→ Yes, to demonstrate the bike isn't pulled free. Neg. Man. addressed in ER1002.05

- **The up-test would be $75 + \text{Bike} = 105 \text{ lbs}$
[I'm thinking of using a spring scale rather than reorientating the whole rack.]**

5. 3.3 Side Load

Are these tests just per Bike Mount?

The side-test would be 100 lbs. Again just do simple side pull for this low value.

How are you provided the 3 Bike side bending? *→ have not addressed in ER1002.05*

6. 5.5 Contaminated Mechanism Pull Test

Should do a set of tests by pulling on the Bike or higher up? *→ Can do -*

Forward direction opens the clamp rollers but, pushes more on cam

Aft direction tightens clamping rollers

ENGINEERING REPORT

ER1002.01

AIRBUS HELICOPTERS AS350 & AS355 SERIES

QUICK RELEASE BIKE RACK

COMPLIANCE REPORT

JASON REVIEWED

14 SEPT 2015

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 0, 14 September 2015

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

Phone: 604-483-2376

Fax: 604-483-2372

www.aerodesign.ca

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1.0 INTRODUCTION

This report details the method of compliance for the paragraphs of FAR 27 listed in Certification Plan CP1002. It includes:

- generation of the applied loads to be used for the analysis and load testing used in the structural certification of the bicycle rack.
- analysis of reactions on the mounting provisions
- certification statements related to doors and lights.

2.0 REFERENCE TEXT

Aero Design Ltd. Load Test Plan and Report TR1002.02, Revision 0, dated XX, Airbus Helicopters AS350/AS355 Quick Release Bicycle Rack

Aero Design Ltd. Load Test Plan and Report TR1002.06, Revision 0, dated XX, Airbus Helicopters EC130 B4 Quick Release Bicycle Rack

Aero Design Ltd. Engineering Report ER764.05, Revision 0, dated 16 June 2010, Quick Release Mounting Provisions and Cargo Basket, approved by E. Burgoin DAR 290M

-bicycle rack uses provisions included on the quick release mounts used for the cargo basket installation.

Aero Design Ltd. Engineering Report ER940.01, Revision 0, dated 20 October 2011, Quick Release Cargo Basket and Mounting Provisions, approved by E. Burgoin DAR 290M

-loads due to bicycle rack installation are similar to cargo basket installation

Albert C. Gross, Chester R. Kyle and Douglas J. Malewicki (1983). The Aerodynamics of Land Vehicles, Scientific American 249, no. 9

Robert D Belvins (1984). Applied Fluid Dynamics Handbook, Van Nostrand Reinhold Company Inc.

Aero Design Ltd. Installation Drawings:

100201, Revision 0 – Bicycle Rack Installation

78602, Revision 1 – Quick Release Mounting Provisions Installation

78603, Revision 1 – Quick Release Mounting Provisions Installation (Cheek Pod Compatible)

Aero Design Ltd. Fabrication Drawings:

100210, Revision 0 – Bike Rack Assembly

100215, Revision 0 – Rack Base Assembly

100220, Revision 0 – Forward Frame Fabrication

100221, Revision 0 – Aft Frame Fabrication

100222, Revision 0 – Bushing Fabrication

100223, Revision 0 – Strap Fabrication
100230, Revision 0 – Beam Fabrication

3.0 BASIS OF CERTIFICATION

Refer to Certification Plan CP1002, Revision 1, Section 5.5 for the applicable basis of certification.

4.0 LOADS

4.1 Load Factors

Quick Release Bike Rack - Airbus Helicopters AS350/AS355

FAR 27.561(b)(3)

Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} := 1.5$
Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} := 4.0$
Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} := 2.0$
Ultimate Downward Emergency Landing Load Factor:	$n_{e_down} := 4.0$

FAR 27.625 Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

FAR 27.303 Safety Factor: $n_{sf} := 1.5$

FAR 27.337(a)

	Limit Positive Maneuvering Load Factor:	$n_{man} := 3.5$
$n_{man_ult} := n_{man} \cdot n_{sf}$	Ultimate Positive Maneuvering Load Factor:	$n_{man_ult} = 5.25$
	Limit Negative Maneuvering Load Factor:	$n_{man_neg} := -1.0$
$n_{man_neg_u} := n_{man_neg} \cdot n_{sf}$	Ultimate Negative Maneuvering Load Factor:	$n_{man_neg_u} = -1.5$

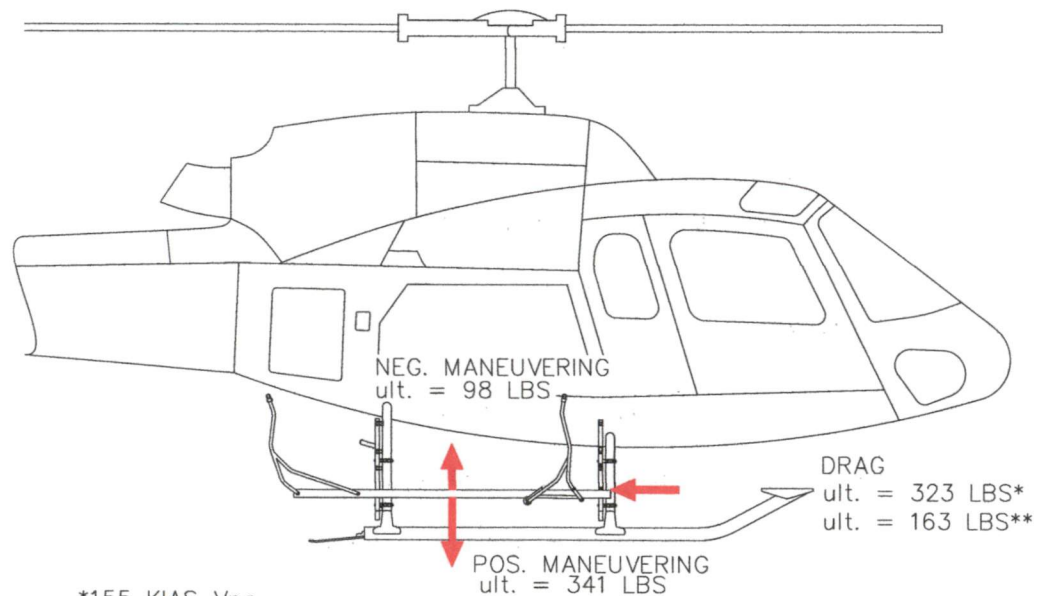
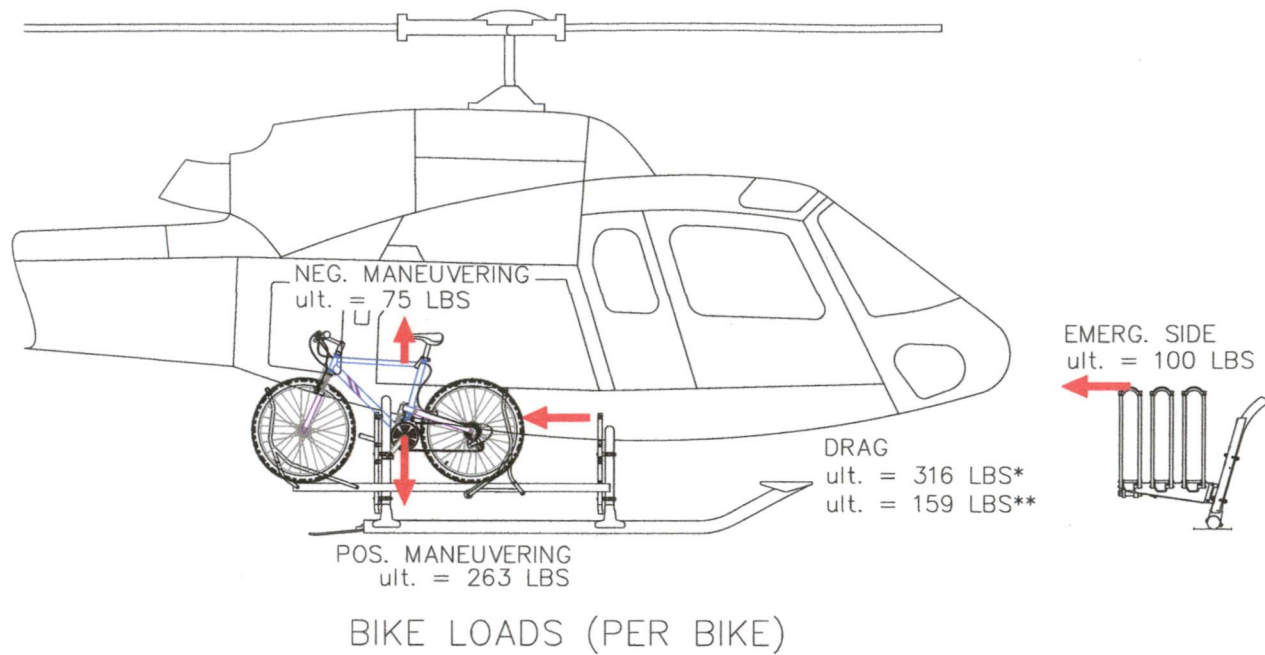
CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Maneuvering Load Factor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 2$

Note: The bike racks are mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the bike racks in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the bikes and racks remain secured in flight.

4.2 Loads Overview



*155 KIAS Vne

**110 KIAS Vne

RACK LOADS

Figure 4.2.1 – Overview of Applied Loads

Loads Summary:

Ultimate Load Condition	Rack	Bike (50 lb)	Combined (Rack + 3 bikes @ 50 lbs)
Positive Maneuvering	315 lb	263 lbs	1102 lbs
Drag	163 lb	159 lbs	640 lbs
Negative Maneuvering	90 lbs	75 lbs	315 lbs
Side	120 lbs	100 lbs	420 lbs

4.3 Inertia Loads

4.3.1 Weights

It is expected the bikes will average 35-40 lbs when equipped for the type of riding to be performed when dropped off by helicopter. The racks will be limited by placard and flight manual supplement to 150 lbs total per rack and 50 lbs maximum per bike per side.

$$W_{\text{rack}} := 60 \cdot \text{lbf} \quad \text{Weight of bike rack}$$

$$W_{\text{bike}} := 50 \cdot \text{lbf} \quad \text{Weight of bike (max)}$$

4.3.2 Positive Maneuvering Load

Bike rack only

$$P_{\text{man_lim_rack}} := W_{\text{rack}} \cdot n_{\text{man_lim}}$$

$$P_{\text{man_lim_rack}} = 210 \cdot \text{lbf} \quad \text{Limit positive maneuvering load due to rack}$$

$$P_{\text{man_ult_rack}} := P_{\text{man_lim_rack}} \cdot n_{\text{sf}}$$

$$P_{\text{man_ult_rack}} = 315 \cdot \text{lbf} \quad \text{Ultimate positive maneuvering load due to rack}$$

Bike 1, 2, 3 (all positions) – 50 lbs

$$P_{\text{man_lim_bike}} := (W_{\text{bike}}) \cdot n_{\text{man_lim}}$$

$$P_{\text{man_lim_bike}} = 175 \cdot \text{lbf} \quad \text{Limit positive maneuvering load due to 50 lb bike only}$$

$$P_{\text{man_ult_bike}} := P_{\text{man_lim_bike}} \cdot n_{\text{sf}}$$

$$P_{\text{man_ult_bike}} = 263 \cdot \text{lbf} \quad \text{Ultimate positive maneuvering load due to 50 lb bike only}$$

Combined rack and bikes

$$P_{\text{man_lim}} := P_{\text{man_lim_rack}} + 3 \cdot P_{\text{man_lim_bike}}$$

$$P_{\text{man_lim}} = 735 \cdot \text{lbf} \quad \text{Limit positive maneuvering load due to rack and bikes}$$

$$P_{\text{man_ult}} := P_{\text{man_lim}} \cdot n_{\text{sf}}$$

$$P_{\text{man_ult}} = 1102 \cdot \text{lbf} \quad \text{Ultimate positive maneuvering load due to rack and bikes}$$

4.3.3 Negative Maneuvering Load / Upward Emergency Landing Load

The ultimate negative maneuvering load and emergency upward load factors are the same. The individual bicycle rack assemblies must restrain the bicycle under this condition, and the entire assembly must support the loads back to the attachments.

Bike rack only:

$$P_{\text{man_neg_lim_rack}} := W_{\text{rack}} \cdot n_{\text{man_neg}}$$

$$P_{\text{man_neg_lim_rack}} = -60 \cdot \text{lbf} \quad \text{Limit negative maneuvering load due to rack}$$

$$P_{\text{man_neg_ult_rack}} := P_{\text{man_neg_lim_rack}} \cdot n_{\text{sf}}$$

$$P_{\text{man_neg_ult_rack}} = -90 \cdot \text{lbf} \quad \text{Ultimate negative maneuvering load due to rack}$$

Bike 1, 2, 3 (all positions) – 50 lbs

$$P_{\text{man_neg_lim_bike}} := (W_{\text{bike}}) \cdot n_{\text{man_neg}}$$

$$P_{\text{man_neg_lim_bike}} = -50 \cdot \text{lbf} \quad \text{Limit negative maneuvering load due to 50 lb bike only}$$

$$P_{\text{man_neg_ult_bike}} := P_{\text{man_neg_lim_bike}} \cdot n_{\text{sf}}$$

$$P_{\text{man_neg_ult_bike}} = -75 \cdot \text{lbf} \quad \text{Ultimate negative maneuvering load due to 50 lb bike only}$$

Combined rack and bikes

$$P_{\text{man_neg_lim}} := P_{\text{man_neg_lim_rack}} + 3 \cdot P_{\text{man_neg_lim_bike}}$$

$$P_{\text{man_neg_lim}} = -210 \cdot \text{lbf} \quad \text{Limit negative maneuvering load due to rack and bikes}$$

$$P_{\text{man_neg_ult}} := P_{\text{man_neg_lim}} \cdot n_{\text{sf}}$$

$$P_{\text{man_neg_ult}} = -315 \cdot \text{lbf} \quad \text{Ultimate negative maneuvering load due to rack and bikes}$$

4.3.4 Sideward Emergency Landing Load

The individual bicycles must be restrained under the sideward emergency landing load.

Bike 1, 2, 3 (all positions) – 50 lbs

$$P_{\text{e_side_bike}} := W_{\text{bike}} \cdot n_{\text{e_side}}$$

$$P_{\text{e_side_bike}} = 100 \cdot \text{lbf} \quad \text{Ultimate sideward load on 50 lb bike}$$

Combined rack and bikes

$$P_{\text{e_side}} := (W_{\text{rack}} + 3 \cdot W_{\text{bike}}) \cdot n_{\text{e_side}}$$

$$P_{\text{e_side}} = 420 \text{ lbf} \quad \text{Ultimate sideward load on rack and bikes}$$

4.4 Aerodynamic Loads

4.4.1 Drag Load

Drag Load on Bike Rack – Basic aircraft Vne

$$A_{f_rack} := 206 \cdot \text{in}^2 = 1.4 \cdot \text{ft}^2$$

Frontal Area of bike rack

$$C_{Do} := 1.5$$

Drag Coefficient of Rack, (overestimated)
(Ref: Fluid Dynamics Handbook, Belvins)

$$\rho := 0.002378 \cdot \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{ne} := 155 \cdot \text{knots} = 262 \cdot \frac{\text{ft}}{\text{s}}$$

Never-Exceed-Speed of AS350/AS355
(Ref. TCDS H-83.)

$$V_d := \frac{V_{ne}}{0.9}$$

$$V_d = 172 \cdot \text{knots} = 291 \cdot \frac{\text{ft}}{\text{s}}$$

Design Dive Speed of AS350/AS355

$$P_{\text{drag_lim_rack}} := \frac{\rho}{2} \cdot V_d^2 \cdot A_{f_rack} \cdot C_{Do}$$

$$P_{\text{drag_lim_rack}} = 216 \cdot \text{lbf}$$

Limit Drag load on bike rack (empty)

$$P_{\text{drag_ult_rack}} := P_{\text{drag_lim_rack}} \cdot n_{sf}$$

$$P_{\text{drag_ult_rack}} = 323 \cdot \text{lbf}$$

Ultimate Drag load on bike rack (empty)

Drag Load on Bikes – Basic aircraft Vne

The frontal area and drag coefficient are determined from the chart Human Powered Vehicle Performance, in Appendix A. The commuter type bikes are most similar to the mountain/downhill type bikes to be used in this on the chart, which weigh 25 lbs. In order to adequately represent the increased frontal area of the heavier bikes, the square-cube relationship is used to determine the proportional increase in area based on the increase in volume, and therefore mass.

$$A_{f_bike_25lb} := 1.2 \cdot \text{ft}^2$$

Frontal Area of 25 lb bike

Ref: The Aerodynamics of Human-powered Land Vehicles
by Gross, Kyle and Malewicki
Human Powered Vehicle Performance - Dragless Human
(Chart in Appendix A)

Area increases by the proportional increase squared, volume/mass increases by the proportional increase cubed. Working backwards from the increase in mass:

$$A_{f_bike_50lb} := A_{f_bike_25lb} \cdot \left(\frac{50 \cdot lbf}{25 \cdot lbf} \right)^{\frac{2}{3}}$$

$$A_{f_bike_50lb} = 274 \text{ in}^2 = 1.9 \text{ ft}^2 \quad \text{Frontal Area of 50 lb bike}$$

$$C_{Do} := 1.1$$

Drag Coefficient of bike

Ref: The Aerodynamics of Human-powered Land Vehicles
Human Powered Vehicle Performance - Dragless Human

$$P_{drag_lim_bike} := \frac{\rho}{2} \cdot V_d^2 \cdot A_{f_bike_50lb} \cdot C_{Do}$$

$$P_{drag_lim_bike} = 211 \cdot lbf \quad \text{Limit Drag load on 50 lb bike (each)}$$

$$P_{drag_ult_bike} := P_{drag_lim_bike} \cdot n_{sf}$$

$$P_{drag_ult_bike} = 316 \cdot lbf \quad \text{Ultimate Drag load on 50 lb bike (each)}$$

Combined drag due to rack and bikes

$$P_{drag_lim} := P_{drag_lim_rack} + 3 \cdot P_{drag_lim_bike}$$

$$P_{drag_lim} = 847 \cdot lbf \quad \text{Limit drag load (bike rack and 3 bikes)}$$

$$P_{drag_ult} := P_{drag_ult_rack} + 3 \cdot P_{drag_ult_bike}$$

$$P_{drag_ult} = 1271 \cdot lbf \quad \text{Ultimate drag load (bike rack and 3 bikes)}$$

At the basic aircraft V_{NE} , the drag loads on the bikes and rack are significantly higher than the cargo basket installation tested at 520 lbs using the same mounting provisions, reference Engineering Report ER940.01. To bring the drag loads more in line with the cargo basket loads, the V_{NE} of the aircraft is limited to 110 KIAS with the bike racks loaded. Drag on the empty rack at the basic aircraft V_{NE} is lower than the basket and therefore does not require reduction.

Drag Load on Bike Rack – Reduced Vne

$$A_{f_rack} := 206 \cdot \text{in}^2 = 1.4 \cdot \text{ft}^2$$

Frontal Area of bike rack

$$C_{Do} := 1.5$$

Drag Coefficient of Rack, (overestimated)
(Ref: Fluid Dynamics Handbook, Belvins)

$$\rho := 0.002378 \cdot \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{ne} := 110 \cdot \text{knots} = 186 \cdot \frac{\text{ft}}{\text{s}}$$

Never-Exceed-Speed of with bike rack installed

$$V_d := \frac{V_{ne}}{0.9}$$

$$V_d = 122 \cdot \text{knots} = 206 \cdot \frac{\text{ft}}{\text{s}}$$

Design Dive Speed with bike rack installed

$$P_{\text{drag_lim_rack}} := \frac{\rho}{2} \cdot V_d^2 \cdot A_{f_rack} \cdot C_{Do}$$

$$P_{\text{drag_lim_rack}} = 109 \cdot \text{lbf}$$

Limit Drag load on bike rack (empty)

$$P_{\text{drag_ult_rack}} := P_{\text{drag_lim_rack}} \cdot n_{sf}$$

$$P_{\text{drag_ult_rack}} = 163 \cdot \text{lbf}$$

Ultimate Drag load on bike rack (empty)

Drag Load on Bikes – Reduced Vne

$$A_{f_bike_50lb} = 274 \text{ in}^2 = 1.9 \text{ ft}^2$$

Frontal Area of 50 lb bike

$$C_{Do} := 1.1$$

Drag Coefficient of bike
Ref: The Aerodynamics of Human-powered Land Vehicles
Human Powered Vehicle Performance - Dragless Human

$$P_{\text{drag_lim_bike}} := \frac{\rho}{2} \cdot V_d^2 \cdot A_{f_bike_50lb} \cdot C_{Do}$$

$$P_{\text{drag_lim_bike}} = 106 \cdot \text{lbf}$$

Limit Drag load on 50 lb bike (each)

$$P_{\text{drag_ult_bike}} := P_{\text{drag_lim_bike}} \cdot n_{sf}$$

$$P_{\text{drag_ult_bike}} = 159 \cdot \text{lbf}$$

Ultimate Drag load on 50 lb bike (each)

$$P_{\text{drag_lim}} := P_{\text{drag_lim_rack}} + 3 \cdot P_{\text{drag_lim_bike}}$$

$$P_{\text{drag_lim}} = 427 \cdot \text{lbf}$$

Limit drag load (bike rack and 3 bikes)

$$P_{\text{drag_ult}} := P_{\text{drag_ult_rack}} + 3 \cdot P_{\text{drag_ult_bike}}$$

$$P_{\text{drag_ult}} = 640 \cdot \text{lbf}$$

Ultimate drag load (bike rack and 3 bikes)

There are 3 configurations of mounting beams for the AS350 / AS355. The farthest outboard configuration is the cargo pod compatible configuration, 78603-01-XX. The later aerodynamic center of each bike is located at B.L. 47.8 (1214 mm), 55.8 (1417 mm) and 63.8 (1621 mm). The vertical aerodynamic center will vary with each bike depending on tire size and equipment, but it is not expected to exceed the top of the tire. The largest tire that can be accommodated is 29" in diameter, locating the aerodynamic center 29" above the rack, 41.4" (1052 mm) above the bottom of the skid tube.

5.0 STRUCTURAL ANALYSIS

The unloaded bike rack does not exceed the loads demonstrated for the cargo basket configuration using the same mounts, reference Engineering Report ER940.01.

5.1 Combined Positive Maneuvering and Drag Load Condition

Structural compliance for the bicycle rack assembly and mounting provisions in the positive maneuvering condition are demonstrated by test, see load test plan and report TR1002.02.

The rack and mounting provisions must support the positive maneuvering loads and drag loads due to the rack and bikes combined. The required applied loads are:

$P_{\text{man_lim_rack}} = 210 \text{ lbs}$	Limit positive maneuvering load due to rack
$P_{\text{man_lim_bike}} = 175 \text{ lbs}$	Limit positive maneuvering load due to each bike
$P_{\text{drag_lim}} = 427 \text{ lbs}$	Limit drag load
$P_{\text{man_ult_rack}} = 315 \text{ lbs}$	Ultimate positive maneuvering load due to rack
$P_{\text{man_ult_bike}} = 263 \text{ lbs}$	Ultimate positive maneuvering load due to each bike
$P_{\text{drag_ult}} = 640 \text{ lbs}$	Ultimate drag load

The tube section of the rack must restrain each bike under the drag condition. The rack cannot open or otherwise deform sufficiently to allow the bike to be released from the rack when subjected to drag loads up to the ultimate drag load. The required applied loads are:

$P_{\text{drag_ult_bike}} = 104 \text{ lbs}$	Ultimate drag load on bike
--	----------------------------

5.1.1 Attachment Reactions

The reaction loads at the attachments to the cross tube are compared to the loads applied by the cargo basket. The C of G of the smallest bikes is located forward of the aft mounting beam. As the size of the bike increases more load will be shared to the forward attachment. To be conservative this analysis considers the weight of a larger bike at the aft position of a smaller bike. The aft beam is critical.

Sum moments about forward end:

$$P_{\text{aft_rack}} := \frac{P_{\text{man_ult_rack}} \cdot 36.75 \cdot \text{in}}{56.25 \cdot \text{in}}$$

$$P_{\text{aft_rack}} = 206 \cdot \text{lbf} \quad \text{Ultimate reaction due to rack distributed to aft attachment}$$

$$P_{\text{fwd_rack}} := P_{\text{man_ult_rack}} - P_{\text{aft_rack}}$$

$$P_{\text{fwd_rack}} = 109 \text{ lbf} \quad \text{Ultimate reaction due to rack distributed to forward attachment}$$

$$P_{\text{aft_bike}} := \frac{P_{\text{man_ult_bike}} \cdot 49.0 \cdot \text{in}}{56.25 \cdot \text{in}}$$

$$P_{\text{aft_bike}} = 229 \cdot \text{lbf}$$

Ultimate reaction due to bike distributed to aft attachment (each)

$$P_{\text{fwd_bike}} := P_{\text{man_ult_bike}} - P_{\text{aft_bike}}$$

$$P_{\text{fwd_bike}} = 34 \text{ lbf}$$

Ultimate reaction due to bike distributed to forward attachment (each)

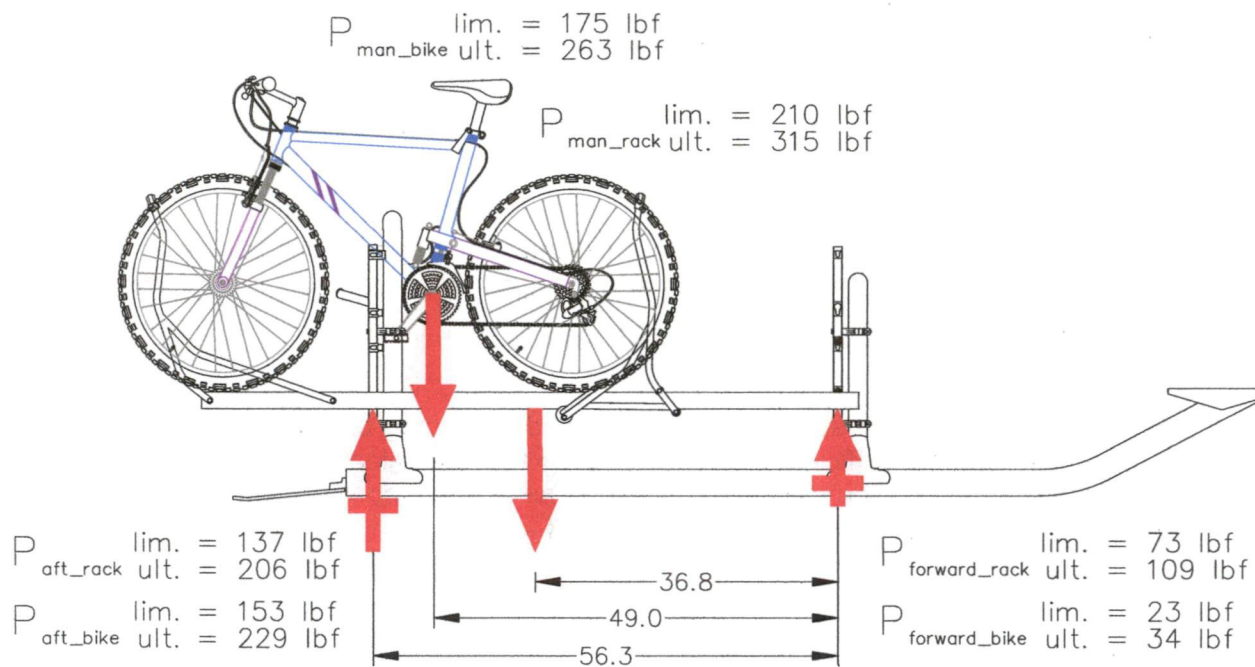


Figure 5.1.1 – Load Distribution

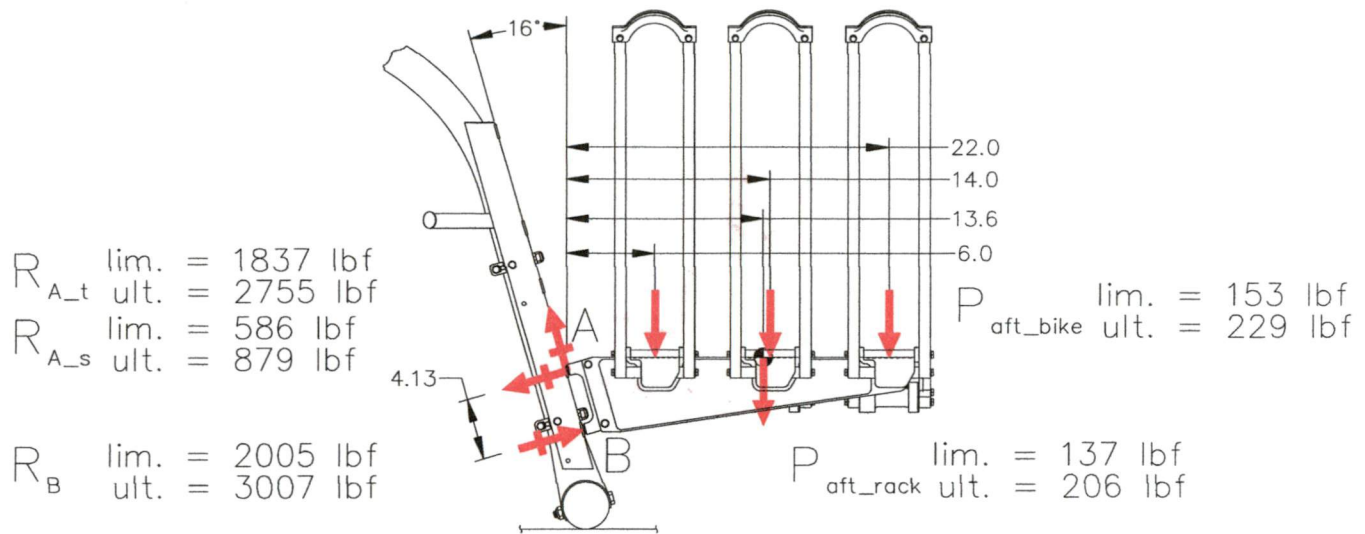


Figure 5.1.2 – Aft Beam Reactions

The maneuvering load is resisted by a couple reaction at A and B.
 Sum moments about A:

$$R_B := \frac{P_{aft_rack} 13.6 \text{ in} + P_{aft_bike} 6.0 \text{ in} + P_{aft_bike} 14.0 \text{ in} + P_{aft_bike} 22.0 \text{ in}}{4.125 \text{ in}}$$

$R_B = 3007 \cdot \text{lbf}$ Ultimate compression reaction at B

Assume all vertical load is carried on upper attachment. Sum forces vertically:

$$R_{Az} := P_{aft_bike} + 3 \cdot P_{aft_bike}$$

$R_{Az} = 915 \cdot \text{lbf}$ Ultimate vertical reaction at A

$$R_{A_s} := R_{Az} \cdot \cos(16 \cdot \text{deg})$$

$R_{A_s} = 879 \text{ lbf}$ Ultimate shear reaction at A

$$R_{A_t} := R_B - R_{Az} \cdot \sin(16 \cdot \text{deg})$$

$R_{A_t} = 2755 \text{ lbf}$ Ultimate tension reaction at A

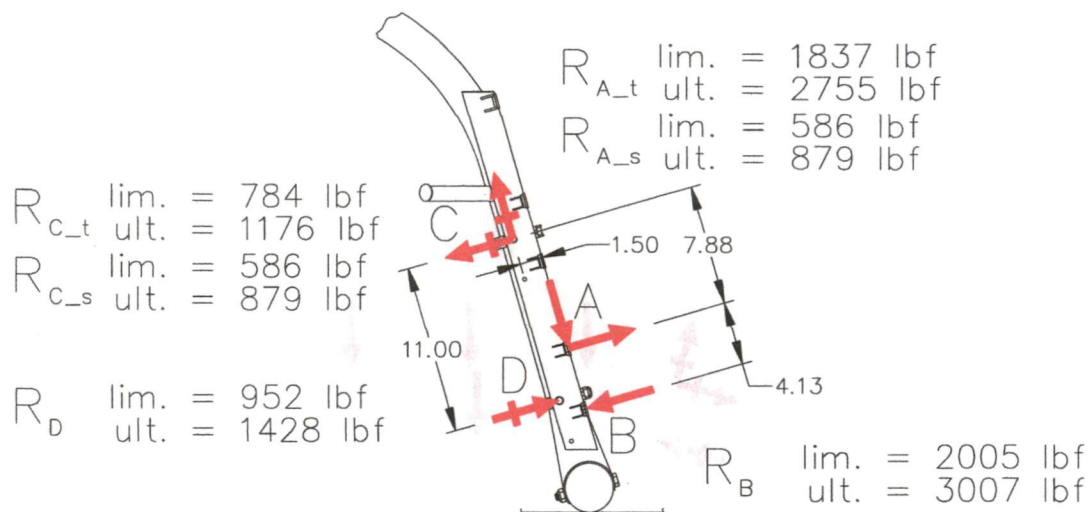


Figure 5.1.3 – Aft Beam Attachment Reactions

Aft Attachment reactions

Sum moments about upper attachment, point C

$$R_D := \frac{R_{A_s} \cdot 1.5 \cdot \text{in} - R_{A_t} \cdot 7.875 \cdot \text{in} + R_B \cdot 12.0 \cdot \text{in}}{11.0 \cdot \text{in}}$$

$$R_D = 1428 \text{ lbf}$$

Ultimate reaction at lower attachment

Assumer upper attachment carries all vertical load. Sum forces vertically (along beam):

$$R_{C_s} := R_{A_s}$$

$$R_{C_s} = 879 \text{ lbf}$$

Ultimate vertical reaction at upper attachment

Sum forces horizontally:

$$R_{C_t} := R_{A_t} + R_D - R_B$$

$$R_{C_t} = 1176 \text{ lbf}$$

Ultimate horizontal reaction at upper attachment

$$R_C := \sqrt{R_{C_s}^2 + R_{C_t}^2}$$

$$R_C = 1468 \text{ lbf}$$

Ultimate reaction at C

Cargo Basket Loads

The loads from the extra large basket installation, configuration 94001, are used as it is the heaviest, largest, and has the highest cargo capacity of all baskets using these mounts.

$$P_{\text{man_ult_basket}} := 1969 \cdot \text{lbf}$$

Ultimate positive maneuvering load tested on basket
(ref: Engineering Report ER940.01)

The basket is symmetrical, and in the load test the cargo load is evenly distributed over the entire bottom, so the loads are applied equally to the forward and aft attachments.

$$P_{\text{aft_basket}} := \frac{P_{\text{man_ult_basket}}}{2}$$

$$P_{\text{aft_basket}} = 984 \cdot \text{lbf}$$

Ultimate reaction due to basket distributed to aft attachment

Aft Attachment reactions

Sum moments about upper attachment, point C

$$R_{D_basket} := \frac{P_{\text{aft_basket}} \cdot 15 \cdot \text{in}}{11.0 \cdot \text{in}}$$

$$R_{D_basket} = 1343 \text{ lbf}$$

Ultimate reaction at lower attachment

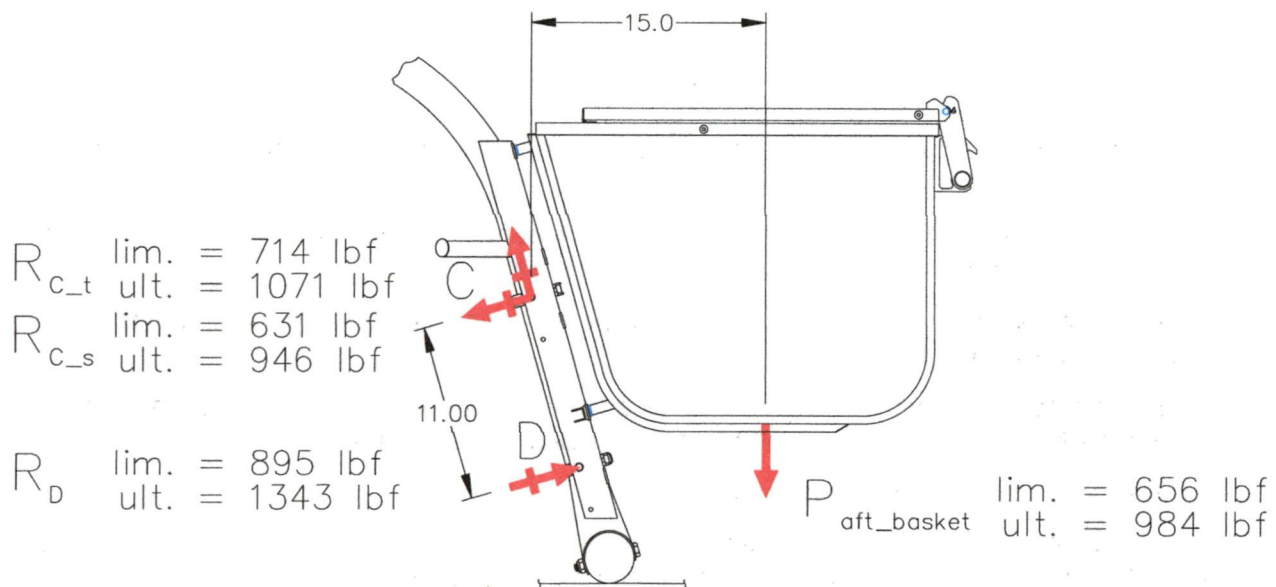


Figure 5.1.4 – Cargo Basket Reaction Loads

Assumer upper attachment carries all vertical load. Sum forces vertically (along beam):

$$R_{C_s_basket} := P_{aft_basket} \cdot \cos(16 \cdot \text{deg})$$

$$R_{C_s_basket} = 946\text{lbf} \quad \text{Ultimate vertical reaction at upper attachment}$$

Sum forces horizontally (across beam):

$$R_{C_t_basket} := R_{D_basket} - P_{aft_basket} \cdot \sin(16 \cdot \text{deg})$$

$$R_{C_t_basket} = 1071\text{lbf} \quad \text{Ultimate horizontal reaction at upper attachment}$$

$$R_{C_basket} := \sqrt{R_{C_s_basket}^2 + R_{C_t_basket}^2}$$

$$R_{C_basket} = 1429\text{lbf} \quad \text{Ultimate reaction at C}$$

$$MS := \frac{R_{D_basket}}{R_D} - 1$$

$$MS = -0.06 \quad \text{Margin of safety at point D}$$

$$MS := \frac{R_{C_basket}}{R_C} - 1$$

$$MS = -0.03 \quad \text{Margin of safety at point C}$$

The small negative margins of safety at the attachment bolts are acceptable for the following reasons:

- The ultimate positive maneuvering load factor cannot be achieved with the bike rack loaded as the Vne is reduced with the bike rack loaded.
- The installation is load tested to confirm the mounting beams and attachments to the cross tube will not fail.
- The increase in reaction load is marginal and does not come close to the shear strength of the AN4 bolts (3680 lbs) used to attach the beam to the clamp.
- See drag load consideration below.

Given the similar reactions at the attachments for the cargo basket and bike racks, the reactions at the landing gear attachments are also similar and remain acceptable.

Drag Load Consideration

Contribution of the drag load was not included in the above comparison of the positive maneuvering condition for the bike rack or cargo basket. Attachment of the mounting beams directly to the helicopter cross tubes helps to minimize deflection of the beams under load. As such, the drag load is applied primarily to the forward attachments as it uses vertical keyways;

the aft beam can only support drag load once the forward attachment has deflected aft to bottom out the lug in the horizontal keyway on the aft beam.

In the cargo basket configuration it is more likely to distribute the drag load to the aft beam as the upper attachments on the beams are cantilever above the attachment to the cross tubes, allowing more deflection of the beam.

In the bike rack configuration the attachments are located low between the attachments to the cross tube. The low position is also closer to the skid tube which prevents deflection of the forward mounting beam to distribute the load aft.

5.2 Negative Maneuvering Load Condition

The bikes must be restrained by the tube frame section of the rack in the ultimate negative maneuvering condition. The required applied load is:

$$P_{\text{man_neg_ult_bike}} = 75 \text{ lbs} \quad \text{Ultimate negative maneuvering load due to bike on rack}$$

This condition has been demonstrated by test of the similar bike rack for the Airbus Helicopters EC130 B4, reference Load Test Plan and Report TR1002.06. The frame assemblies restraining the bikes in this installation are identical to those tested on the EC130 B4 rack.

The base of the rack must transfer the applied negative maneuvering load to the attachments.

Drag reactions on rack attachment. Drag load is divided equally between the forward and aft attachments. Sum moments about forward end.

The required applied loads are:

$$P_{\text{man_neg_lim_rack}} = 65 \text{ lbs} \quad \text{Limit negative maneuvering load due to bike rack}$$

$$P_{\text{man_neg_ult_rack}} = 98 \text{ lbs} \quad \text{Ultimate negative maneuvering load due to bike rack}$$

$$P_{\text{man_neg_lim_bike}} = 50 \text{ lbs} \quad \text{Limit negative maneuvering load due to bike on rack}$$

$$P_{\text{man_neg_ult_bike}} = 75 \text{ lbs} \quad \text{Ultimate negative maneuvering load due to bike on rack}$$

The stainless steel tube section of the mounting beams is symmetrical, therefore the bending moment applied to the tube by the positive maneuvering condition is sufficient to demonstrate the negative maneuvering condition on the mounting beam. The loads applied from the mounting beam to the attachment clamps and the landing gear is also sufficiently demonstrated by the positive maneuvering condition as the opposite direction of the loading still requires the clamp to transfer the loads into the landing gear through friction between the clamp and tube, but at a higher load in the positive condition.

The mounting configuration using horizontal keyways and vertical keyways with one vertical keyway blocked by a pin has been demonstrated in the upward direction to support 550 lbs plus the weight of the basket (71 lbs) with no permanent deformation, reference TR959.05, Rev. 0. The bike rack attachment is identical to the basket tested therefore the results of the testing in TR959.05 are valid for this installation.

5.3 Forward Emergency Landing Load Condition

The bike rack is located below the cabin. Forward deflection of the bike rack does not endanger the occupants in a crash. The sliding frames are limited in forward movement by the forward support beam under the rails at a position that will not block the cabin doors.

5.4 Upward Emergency Landing Load Condition

The bike rack is located aft of the cabin. Deflection in the upward direction does not endanger the occupants in a crash. The negative maneuvering load condition is critical.

5.5 Sideward Emergency Landing Load Condition

The bikes must be restrained by the tube frame section of the rack in the sideward emergency landing condition. The required applied load is:

$$P_{e_side} = 100 \text{ lbs}$$

Ultimate side load due to bike

This condition has been demonstrated by test of the similar bike rack for the Airbus Helicopters EC130 B4, reference Load Test Plan and Report TR1002.06. The frame assemblies restraining the bikes in this installation are identical to those tested on the EC130 B4 rack.

The rack must support the emergency side load back to the attachments.

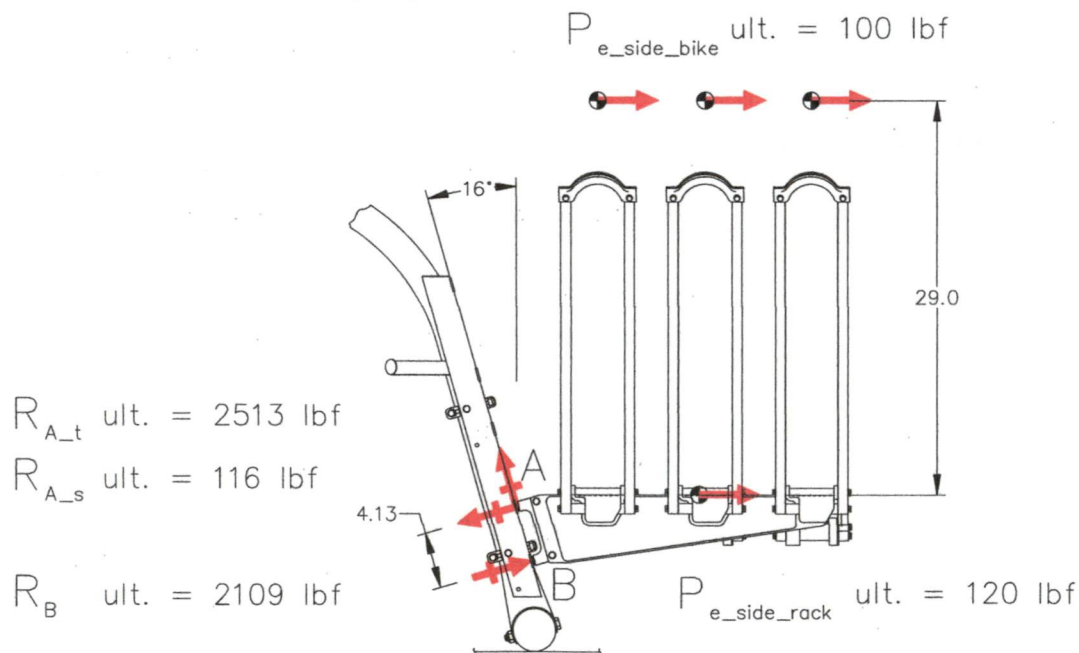


Figure 5.5.1 – Sideward Emergency Landing Condition Load

The side load is resisted by a couple reaction at A and B. Sum moments about A = 0:

$$R_{B_side} := \frac{3 \cdot P_{e_side_bike} \cdot 29 \cdot \text{in}}{4.125 \cdot \text{in}}$$

$$R_{B_side} = 2109 \text{ lbf}$$

Ultimate reaction at B due to side load

Assume upper attachment carries entire shear component of load.

$$R_{A_t_side} := P_{e_side} \cdot \cos(16 \cdot \text{deg}) + R_{B_side}$$

$$R_{A_t_side} = 2513 \text{ lbf}$$

Ultimate tension reaction at A due to side load

$$R_{A_s_side} := P_{e_side} \cdot \sin(16 \cdot \text{deg})$$

$$R_{A_s_side} = 116 \text{ lbf}$$

Ultimate shear reaction at A due to side load

The reactions at point A and B due to the emergency landing side load condition are less than the reactions due to the positive maneuvering condition, see section 5.1.1. The positive maneuvering condition is critical.

6.0 COMPLIANCE WITH FAR 27.783 – DOORS

(a) Each closed cabin must have at least one adequate and easily accessible external door.

No change from Type Approved configuration.

The bike rack is located well below the doors. The bikes are located aft of the cabin doors. The bikes do not interfere with the cabin doors. The loading procedure in the FMS requires the inboard bike to be oriented with the handle bars aft, which will put the widest part of the bike aft of the optional sliding cabin door when fully open.

(b) Each external door must be located where persons using it will not be endangered by the rotors, propellers, engine intakes, and exhausts when appropriate operating procedures are used. If opening procedures are required, they must be marked inside, on or adjacent to the door opening device.

No change from Type Approved configuration.



Figure 6.0.1 – Bike Rack Installed

(Note: the racks have been extended farther aft than shown, and the outboard bike has the larger 29" tires on a long frame)

7.0 COMPLIANCE WITH FAR 27.787 – CARGO COMPARTMENTS

(b) There must be means to prevent the contents of any compartment from becoming a hazard by shifting under the loads specified in paragraph (a) of this section.

The bikes are secured with a frame that locks to the rack with 3 rollers and a cam action, see figure 7.0.1. The rack was tested to demonstrate it can restrain the loads specified in paragraph (a) in Test Plan and Report TR1002.06 for the EC130 B4 configuration, which is identical to this installation.

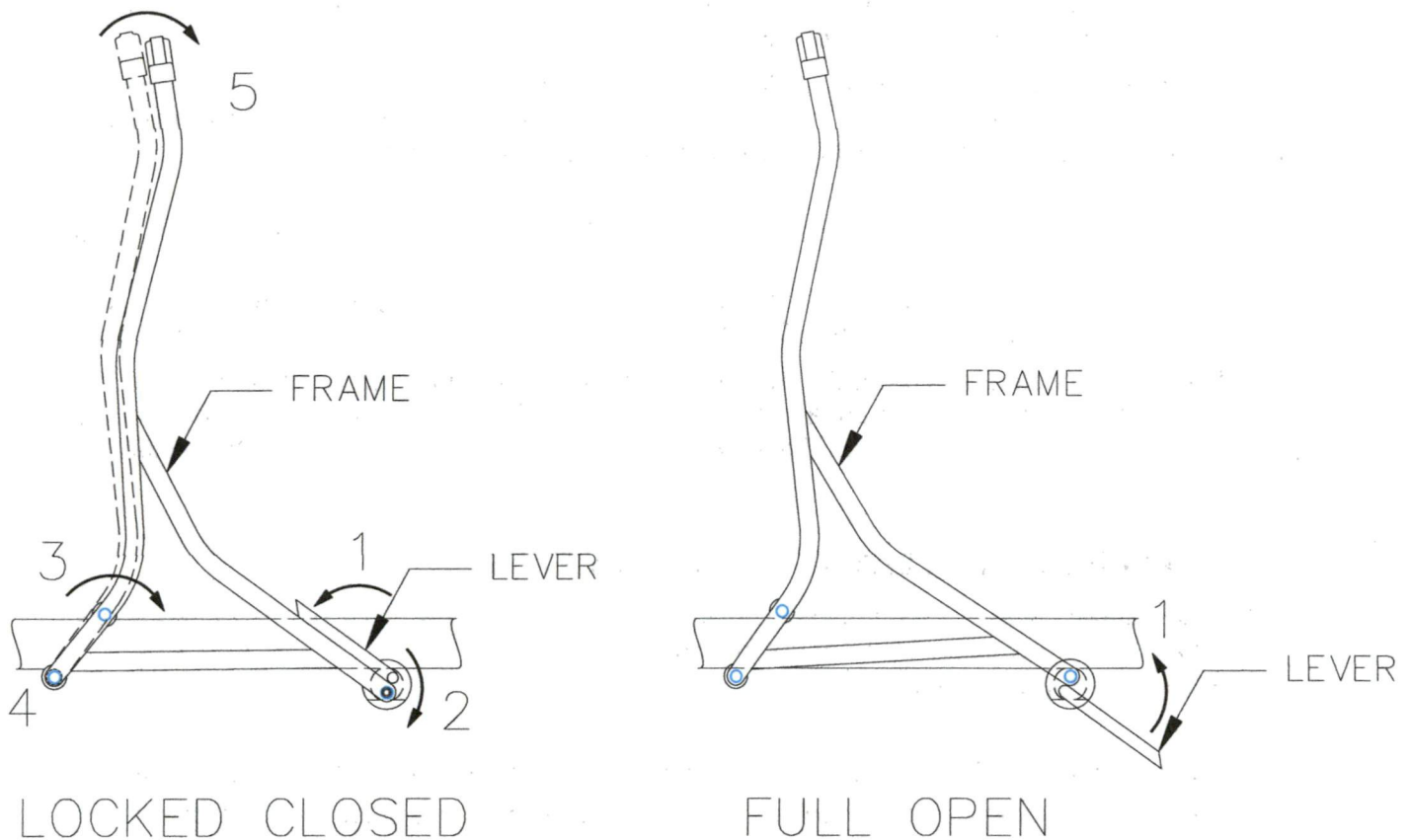


Figure 7.0.1 – Cam Action (LH side shown, forward to the left)

The cam action applies pressure to the bike rack, securing the bike, as follows:

1. The lever begins in the full open position. There is a flat on the cam (reference drawing 100222) in both the open and closed positions to retain the lever in the set position. The frame can be moved along the rack as required when in the open position.
2. As the lever is rotated to the closed position, the cam increases the distance from the axis of the cam to the bottom of the rack at point 2, rotating the frame down between the rollers on the opposite end (points 3 and 4).
3. As the frame rotates the vertical distance between points 3 and 4 is reduced until there is interference between the rollers and the rack, clamping the rollers to the rack.
4. The top of the rack at point 5 rotates aft (1.2") and down (0.25") into the bike tire, locking the bike into the rack.
5. As the lever reaches the locked closed position, a flat on the cam is pressed against the bottom of the rack.

A minimum of 10 lbs is required to rotate the lever from the locked closed position. This greatly exceeds the inertia of the lever.

The locking mechanism was tested in TR1002.06 to ensure the mechanism continues to provide sufficient clamping force when lubricating or abrasive contaminants are applied. Contaminants include: WD-40, Mobil Grease 28, talcum powder, and fine abrasive dust (eg. glass bead or sand).

Aft loading on the top of the frame increases the squeezing action between rollers 3 and 4, increasing the clamp up pressure. Forward loading is restrained by the cam.

The mechanism is not dependent on having a tire in the frame to lock. The frames are locked in place on the rack when the rack is not loaded. If the frames are not locked in place, they are prevented from moving forward next to the cabin by the forward mounting beam.

(c) Under the emergency landing conditions of Sec. 27.561, cargo and baggage compartments must--

(1) Be positioned so that if the contents break loose they are unlikely to cause injury to the occupants or restrict any of the escape facilities provided for use after an emergency landing; or

The bike rack is located outside of the main cabin and is not in a position to cause injury to the occupants. The bikes are located aft of the main cabin doors and are not in a position to prevent opening of the cabin doors. The forward cabin doors are jettisonable from the inside.

8.0 COMPLIANCE WITH FAR 27.807 – EMERGENCY EXITS

(a) Number and location. Rotorcraft with closed cabins must have at least one emergency exit on the opposite side of the cabin from the main door.

No change from Type Approved configuration.

(b) Type and operation. Each emergency exit prescribed in paragraph (a) of this section must—

(1) Consist of a movable window or panel, or additional external door, providing an unobstructed opening that will admit a 19- by 26-inch ellipse;

No change from Type Approved configuration. Forward cabin doors are jettisonable.

(2) Be readily accessible, require no exceptional agility of a person using it, and be located so as to allow ready use, without crowding, in any probable attitudes that may result from a crash;

No change from Type Approved configuration.

(3) Have a simple and obvious method of opening and be arranged and marked so as to be readily located and operated, even in darkness; and

No change from Type Approved configuration.

(4) Be reasonably protected from jamming by fuselage deformation.

No change from Type Approved configuration.

(c) Tests. The proper functioning of each emergency exit must be shown by test.

No change from Type Approved configuration.

(d) Ditching emergency exits for passengers.

Not applicable.

9.0 COMPLIANCE WITH FAR 27.1387, .1401 – LIGHTS

See Figure 1.

The anti-collision strobe light is located on the top of the vertical stabilizer (A). The position lights are located on the top of the cabin, the tips of the horizontal stabilizer and the end of the tailboom (B). The bike rack installation does not block any of these lights.

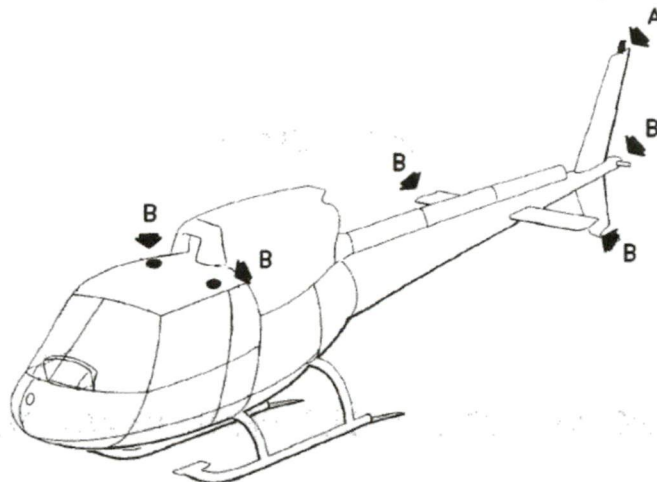






















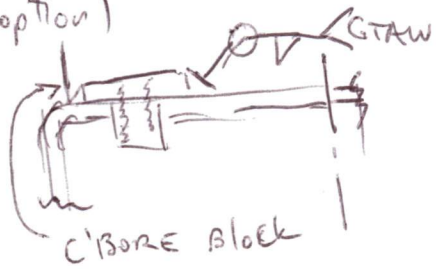
Figure 9.0.1 – Position / Anti-Collision Light Locations

APPENDIX A

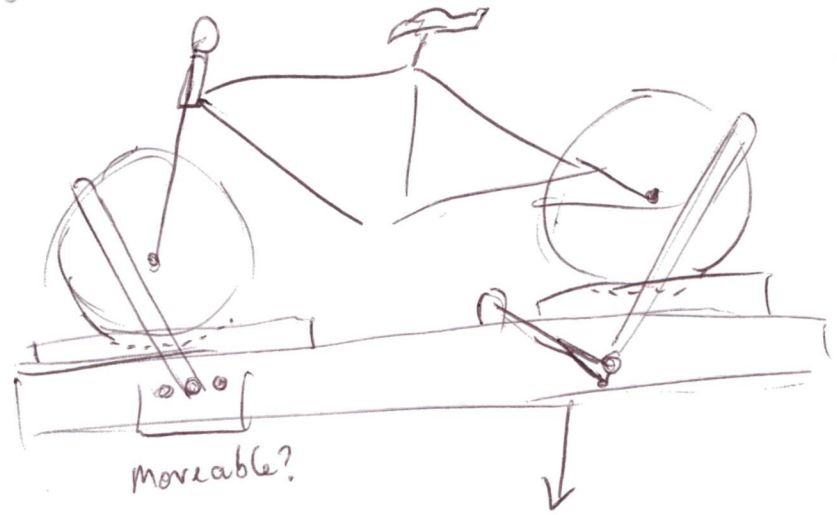
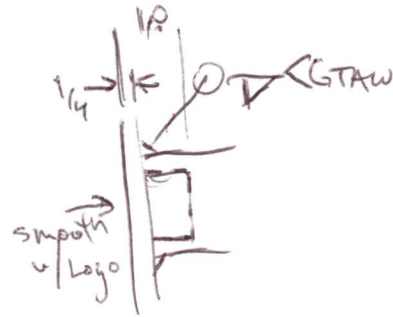
HUMAN POWERED VEHICLE PERFORMANCE CHART

HUMAN POWERED VEHICLE PERFORMANCE													
DESCRIPTION				FORCES AT 20 MPH (POUNDS)	AERODYNAMIC DATA				LEVEL GROUND, NO WINDS				EFFECT OF HILLS
					DRAG COEFFICIENT	FRONTAL AREA (FT ²)	EFFECTIVE FRONTAL AREA (FT ²)	ROLLING RESISTANCE COEFFICIENT	HORSEPOWER REQUIRED AT 20 MPH AS A PERCENTAGE OF THE TOURING (ARMS STRAIGHT) OUTPUT	ALL DAY TOURING SPEED AT 0.1 HORSEPOWER OUTPUT (MPH)	MAXIMUM SPEED WITH 1.0 HORSEPOWER OUTPUT (MPH)	STEADY STATE SPEED UP A 3% GRADE (MPH)	STEADY STATE SPEED DOWN A 3% GRADE (MPH)
					C _D	A	C _D A	C _R					
STANDARD BICYCLES	BMX (YOUTH OFF ROAD RACER)	30 LB BIKE 120 LB RIDER 20" DIA 40PSI KNOBBY TIRES		5.52 2.10	1.1	4.9	5.4	.014	146%	10.1	27.8	12.2	19.8
	EUROPEAN UPRIGHT COMMUTER	40 LB BIKE 160 LB RIDER 27" DIA 40 PSI TIRES		6.14 1.20	1.1	5.5	6.0	.006	140%	11.3	27.6	10.9	24.0
	TOURING (ARMS STRAIGHT)	25 LB BIKE 160 LB RIDER 27" DIA 90 PSI CLINCHER TIRES		4.40 .83	1.0	4.3	4.3	.0045	100%	13.1	31.1	12.2	27.7
	RACING (FULLY CROUCHED)	20 LB BIKE 160 LB RIDER 27" DIA 105 PSI SEWUP TIRES		3.48 .54	.88	3.9	3.4	.003	77%	14.7	33.9	13.0	31.2
PROVED PRODUCTION	AEROCOMPONENT (FULLY CROUCHED)	20 LB BIKE 160 LB RIDER 27" DIA 105 PSI SEWUP TIRES		3.27 .54	.83	3.9	3.2	.003	73%	15.0	34.6	13.0	32.2
	PARTIAL FAIRING (ZIPPER) CROUCHED	21 LB BIKE 160 LB RIDER 27" DIA 105 PSI SEWUP TIRES		2.97 .54	.70	4.1	2.9	.003	67%	15.4	35.7	13.1	33.9
	RECUMBENT (EASY RACER)	27 LB BIKE 160 LB RIDER 20" REAR 20" FRONT 90 PSI CLINCHERS		2.97 .94	.77	3.8	2.9	.005	75%	14.4	35.2	12.5	33.7
	TANDEM	42 LB BIKE TWO 160 LB RIDERS 27" DIA 90 PSI CLINCHERS (181 LBS PER PERSON)		5.32 (2.86) 1.62 (.81)	1.0	5.2	5.2	.0045	66%	15.2	36.6	13.0	35.2
RECORD HPV'S	DRAFTING (CLOSELY FOLLOWING ANOTHER BICYCLIST)	20 LB BIKE 160 LB RIDER 27" DIA 105 PSI SEWUP TIRES		1.94 .54	.50	3.9	1.9	.003	47%	17.5	41.0	13.6	41.7
	BLUE BELL 2 WHEELED SINGLE RIDER	40 LB BIKE 160 LB RIDER 27" REAR 20" FRONT 105 PSI SEWUPS		.61 .80	.12	5.0	.6	.004	27%	22.5	58.6	12.9	77.4
	KYLE 2 WHEELED TWO RIDERS	52 LB BIKE TWO 160 LB RIDERS 105 PSI SEWUPS (116 LBS PER PERSON)		1.44 (.72) 1.12 (.56)	.2	7.0	1.4	.003	24%	23.3	56.6	14.0	69.9
	VECTOR SINGLE TRIKE	68 LB BIKE 160 LB RIDER SEWUPS 27" REAR 24" FRONT		.51 1.02	.11	4.56	.5	.0045	29%	21.8	61.2	11.3	90.1
RETICAL LIMITS	VECTOR TANDEM TRIKE	75 LB BIKE TWO 160 LB RIDERS 24" SEWUPS (190 LBS PER PERSON)		.62 (.31) 1.78 (.89)	.13	4.7	.6	.0045	23%	25.6	72.5	13.0	108.4
	PERFECT BIKE	NO ROLLING RESISTANCE ZERO DRAG ON ENTIRE BIKE DRAG OF HUMAN ONLY IN TOURING POSITION		3.07 0	.8	3.8	3.0	0	59%	16.7	35.9	13.4	34.7
	DRAGLESS HUMAN	ZERO DRAG ON HUMAN DRAG OF BIKE ONLY ROLLING RESISTANCE INCLUDES HUMAN'S WEIGHT		1.33 .81	1.1	1.2	1.3	.0045	41%	18.4	45.8	13.3	50.3
	PERFECT RECUMBENT	DRAG ON FLAT ON BACK HUMAN ONLY		.72 0	.6	1.2	.7	0	14%	27.1	58.3	16.8	66.9
TH	PERFECT PRONE BIKE	DRAG ON 100 LB SMALL BUT POWERFUL HUMAN ONLY		.51 0	.6	.8	.5	0	10%	30.4	65.3	23.2	65.3
	PERFECT PRONE STREAMLINER			.07 0	.05	1.4	.07	0	1%	58.3	125.9	25.6	174.5
	MOTOR PACED	42 LB BIKE 160 LB RIDER VEHICLE BREAKS AIR FOR RIDER TIRES		0 1.21	—	—	—	.006	23%	29.4	294.0	12.6	∞
	MOON BIKE	25 LB BIKE 160 LB RIDER 15 LB SPACE SUIT 27" DIA 90 PSI TIRES 1/6 g ENVIRONMENT		0 .15	—	—	0	.0045	3%	237.5	2,375	78.4	∞

fasten through edges:
(option)



Alt: Fasten through center
w/ blind rivets

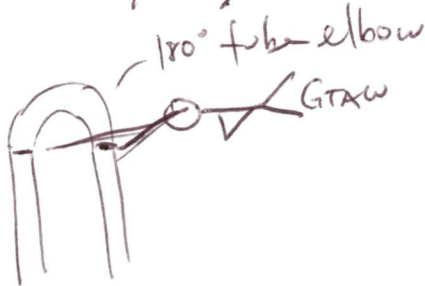


1.02 2x2 UHMW HDPE
2" max
1.5
3" 3x2 x 1/8 wall avail.
large rad 1/4" or more 1/16 - 0.050? wall
this is commercially avail?

Socket ends
deep for
torsional support

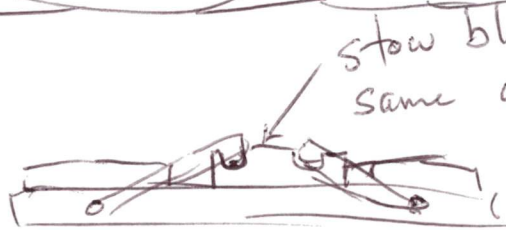
$\phi 3/4 \times 0.065$

$\phi 1.0 \times 0.065 / 0.58 / 0.035?$



? what is available?

step extr. may work
but deeper than
necessary.



possibly on side
or feature of
wheel block

Pivot above
means righty-tighty
= std. hardware

Knurled buttonnut
rotating barrel
Same as on Yakima
rack
thicker than tab.
bolt
barrel bushing
through 1 side?

- no cut out in tube
= better torsion
rigidity
+ no water entry



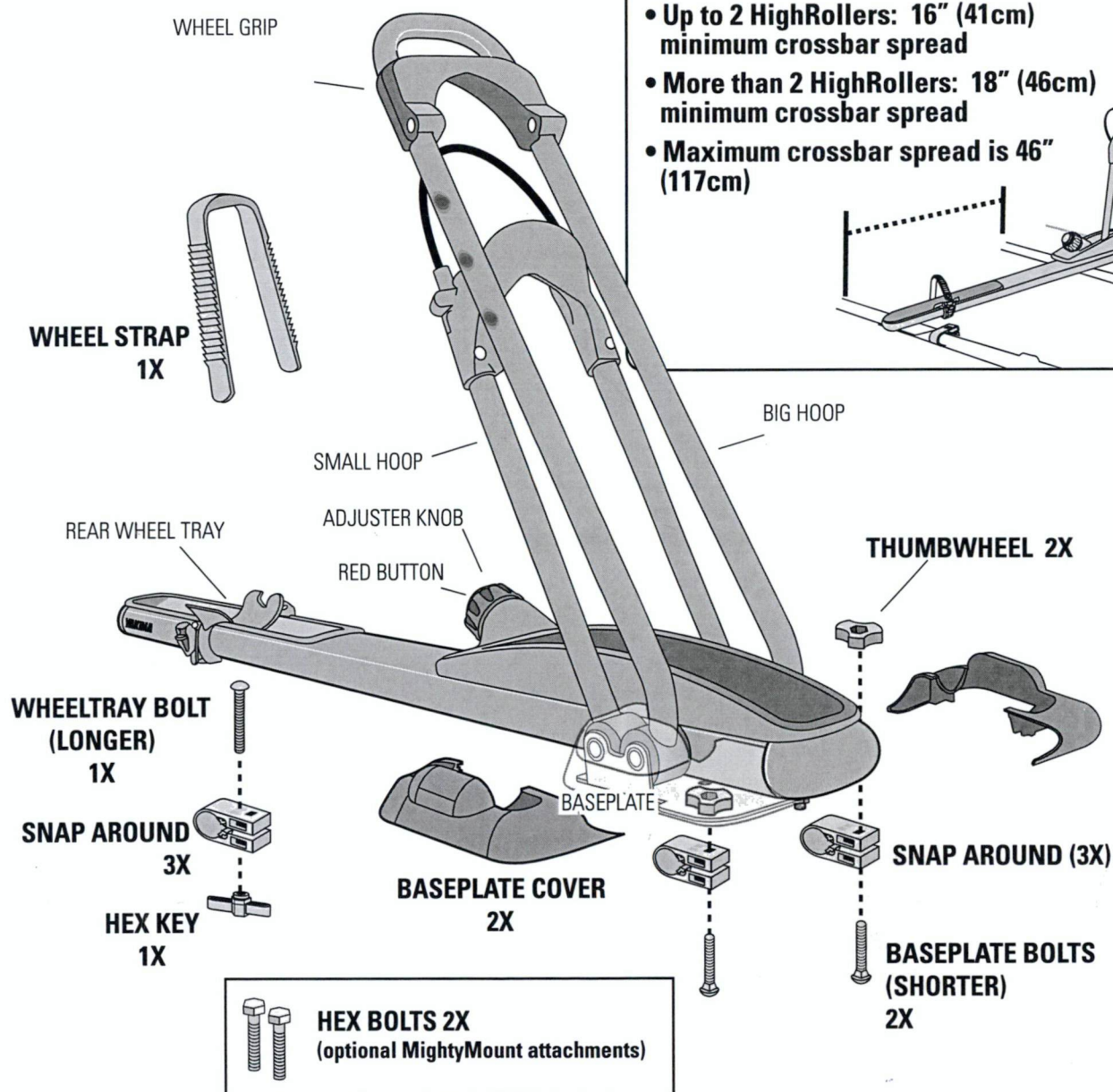
A/C or Part AS350 BIKE RACK
Work Order # 2013-67
Date 27 DEC 2013

Tracking Number	Quantity	Description	Part Number	Serial Number
13088	14	BUSHING ($\phi 7/16 \times 0.065$)		N/A
11101		3/4 \times 0.035 TUBE \downarrow		
	2	RIM LONG		
	2	RIM SHORT		
	2	BRACKET SHORT		
	2	BRACKET LONG		
	2	CROSS MEMBER		
	4	LUG ϕ 5/8 DC		
11033	4	LUG ϕ 5/8		

YAKIMA

HIGHROLLER

US



IMPORTANT WARNING!

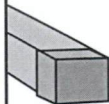
IT IS CRITICAL THAT ALL YAKIMA RACKS AND ACCESSORIES BE PROPERLY AND SECURELY ATTACHED TO YOUR VEHICLE. IMPROPER ATTACHMENT COULD RESULT IN AN AUTOMOBILE ACCIDENT, AND COULD CAUSE SERIOUS BODILY INJURY OR DEATH TO YOU OR TO OTHERS. YOU ARE RESPONSIBLE FOR SECURING THE RACKS AND ACCESSORIES TO YOUR CAR, CHECKING THE ATTACHMENTS PRIOR TO USE, AND PERIODICALLY INSPECTING THE PRODUCTS FOR ADJUSTMENT, WEAR, AND DAMAGE. THEREFORE, YOU MUST READ AND UNDERSTAND ALL OF THE INSTRUCTIONS AND CAUTIONS SUPPLIED WITH YOUR YAKIMA PRODUCT PRIOR TO INSTALLATION OR USE. IF YOU DO NOT UNDERSTAND ALL OF THE INSTRUCTIONS AND CAUTIONS, OR IF YOU HAVE NO MECHANICAL EXPERIENCE AND ARE NOT THOROUGHLY FAMILIAR WITH THE INSTALLATION PROCEDURES, YOU SHOULD HAVE THE PRODUCT INSTALLED BY A PROFESSIONAL INSTALLER SUCH AS A QUALIFIED GARAGE OR AUTO BODY SHOP.

Part #1033349 Rev.G

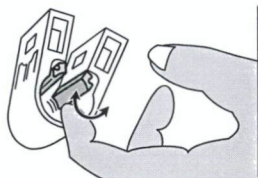
DO YOU HAVE - SQUARE - ROUND - OR OTHER - CROSSBARS?

1

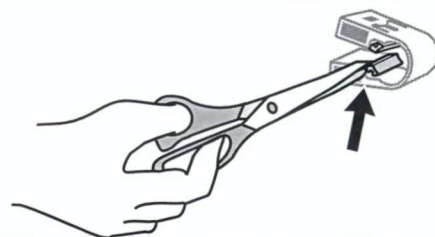
SQUARE



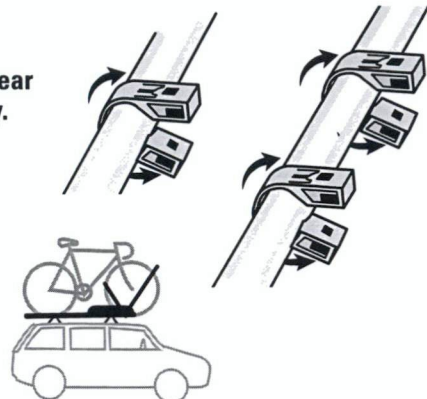
Loosen the tabs in the SnapArounds by bending them repeatedly.



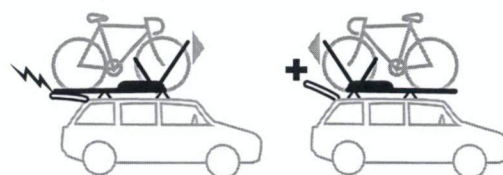
Remove the tabs with scissors or pliers.



- Attach 1 SnapAround on rear bar for wheeltray.
- Attach 2 SnapArounds on front bar for baseplate.

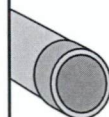


HATCH INTERFERENCE:
HighRoller can face opposite direction when there is hatch interference.

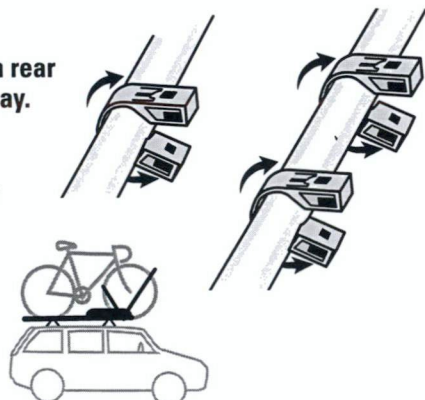


1

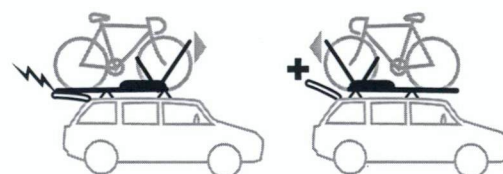
ROUND



- Attach 1 SnapAround on rear bar for wheeltray.
- Attach 2 SnapArounds on front bar for baseplate.

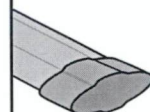


HATCH INTERFERENCE:
HighRoller can face opposite direction when there is hatch interference.



1

OTHER



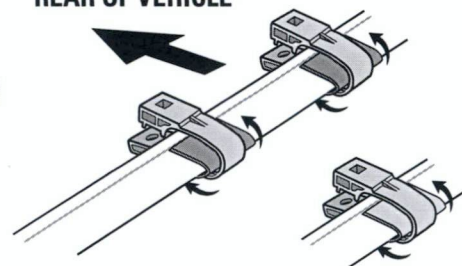
MIGHTYMOUNTS:

- Attach 2 MightyMounts on the rear bar and 1 on the front bar.
- If your MightyMounts require bar caps, install them now. Metal bar caps should be applied to back crossbar (front of bike mount). Refer to this diagram in place of your MightyMount instructions.

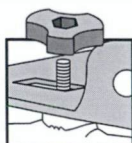
MightyMounts purchased separately
(refer to the YAKIMA Fit List for correct
MightyMounts for your vehicle).



REAR OF VEHICLE

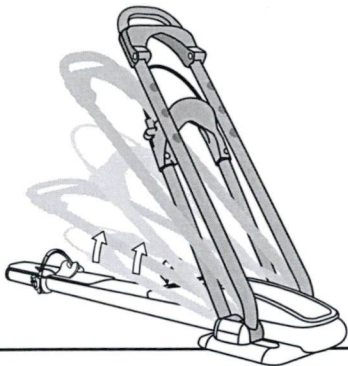


**UNIVERSAL
MIGHTYMOUNT
#03590**

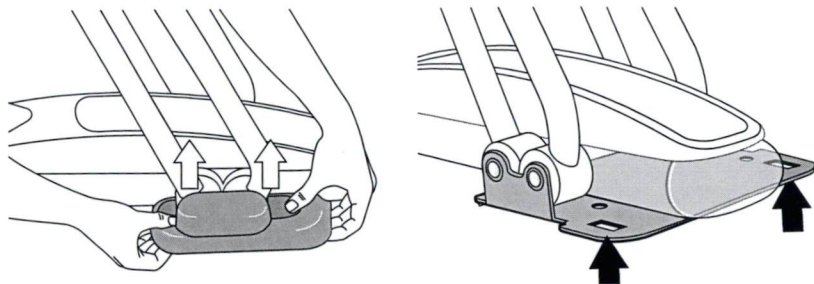


**Follow the Universal MightyMount
instructions and refer to this instruction for
correct installation.**

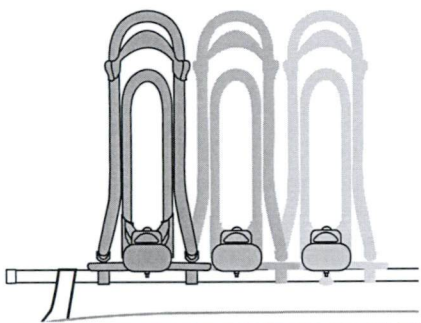
2 Lift both hoops until they stop.



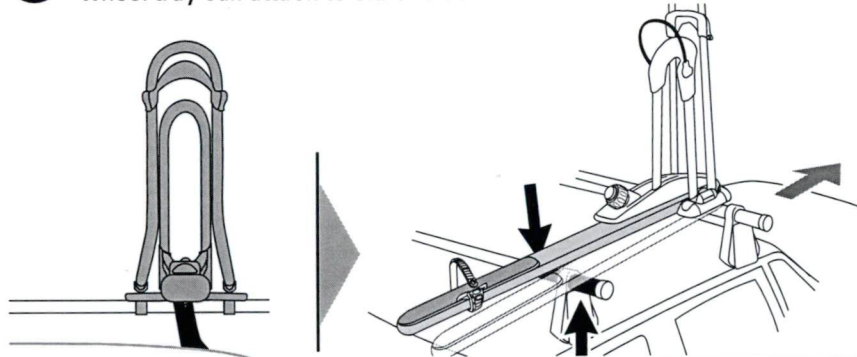
3 Remove baseplate cover. Press sides and lift to expose bolt holes.



4 Position mount anywhere on crossbars.



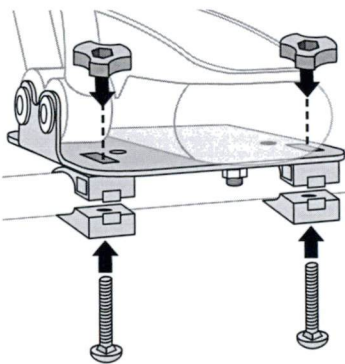
5 If you position the front mount straddling a tower, the wheel tray can attach to either side of the rear tower.



6

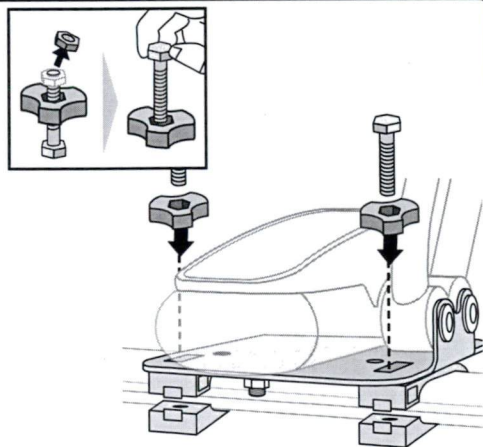
Insert short baseplate bolts through bottom of SnapArounds into baseplate.

LOOSELY ATTACH THUMBWHEELS.

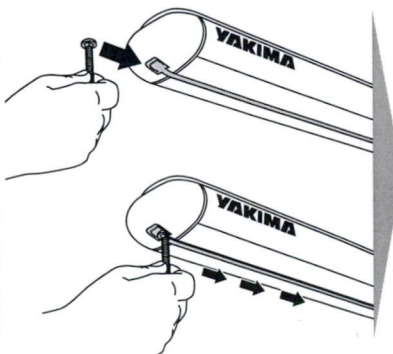


MightyMount users:

- Remove embedded nut in thumbwheel.
- Push hex bolt into top of knob until fully seated.
- Insert hexagonal bolts through thumbwheels into baseplate.
- LOOSELY ATTACH THUMBWHEELS.

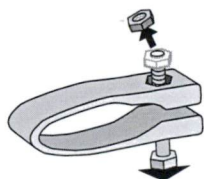


7 Slide wheeltray bolt into rear end of wheeltray.

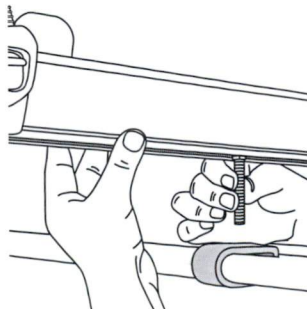


MightyMount users:

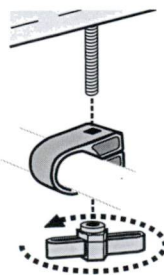
Remove embedded nut in MightyMount.



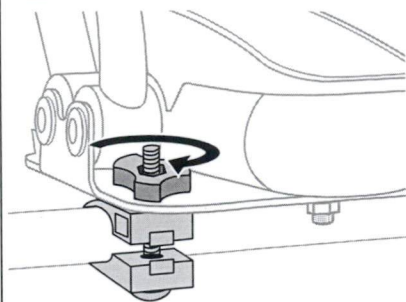
Align bolt to hole...



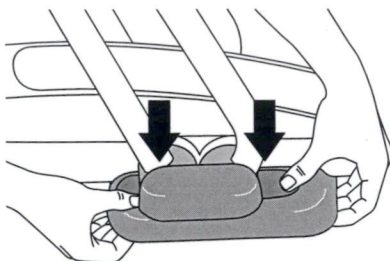
SECURE WITH HEX KEY.



8 Tighten Thumb Wheels.

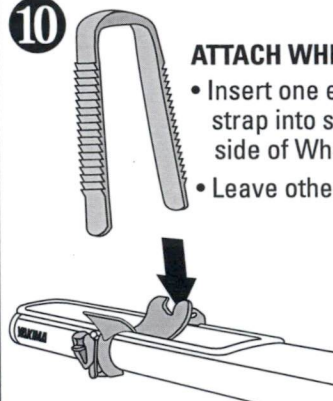


9 Replace baseplate covers. (They should snap into place).

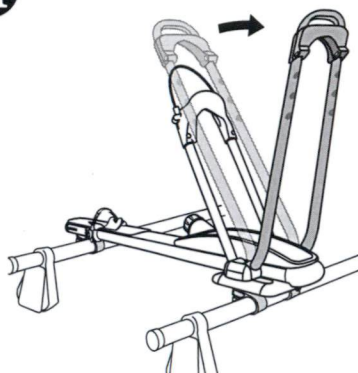


10 **ATTACH WHEEL STRAP**

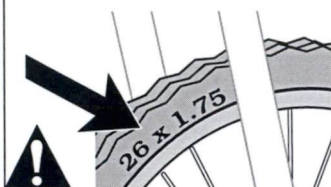
- Insert one end of strap into slot on far side of Wheeltray.
- Leave other end free.



11 Move big hoop forward.



12 Find the tire size of your front wheel.

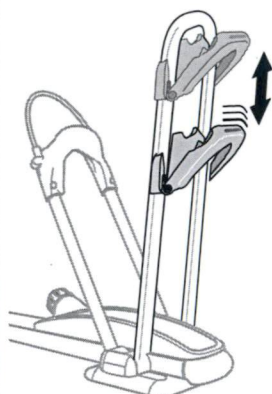


DO NOT USE MOUNT WITH WHEELS UNDER 20" (51cm)

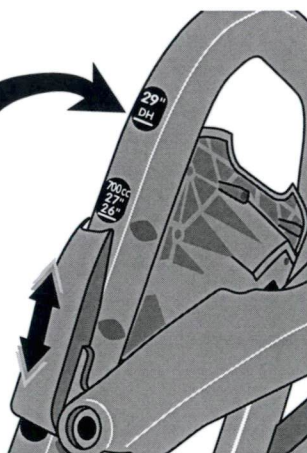
13 Open wheel grip handle.



14 Slide wheel grip until it aligns to your tire size.



Some downhill tires may require a higher setting.

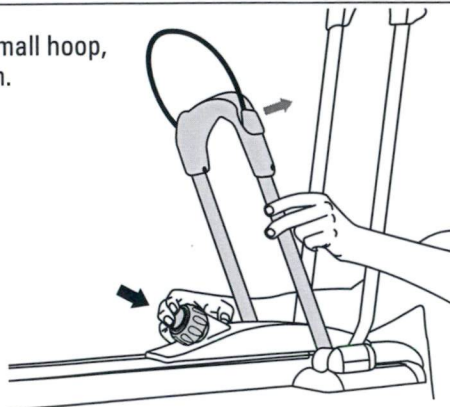


15

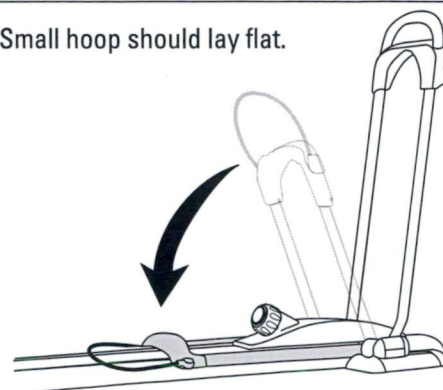


The wheel grip handle must align to a number before it will close.

16 While holding small hoop, press red button.



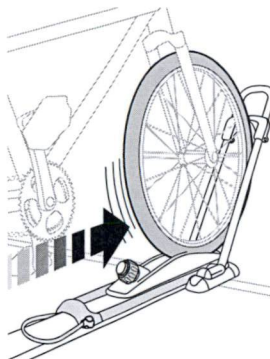
17 Small hoop should lay flat.



18 Lift bike and place front wheel in front hoop.



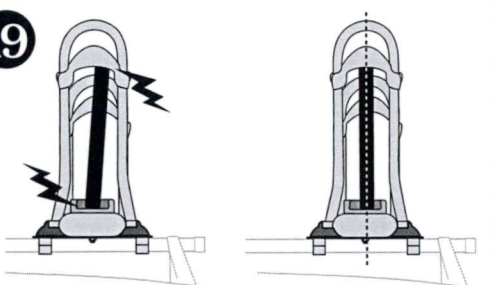
Roll bicycle forward in front tray.



Lift small hoop to rest against tire.



19

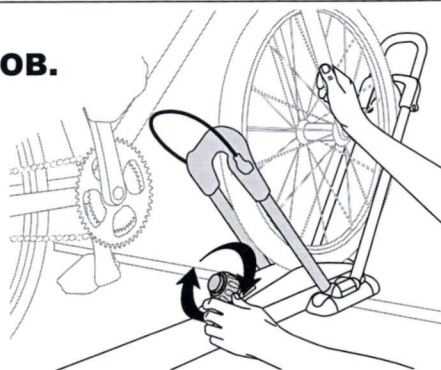


CENTER TIRE IN WHEELGRIP.

20

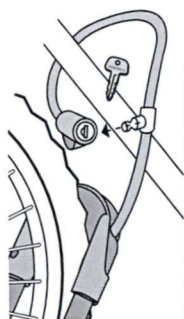
**TIGHTEN
ADJUSTMENT KNOB.**

Smaller hoop should compress against tire. If wheel moves, tighten more.

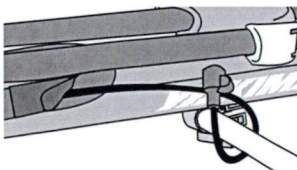


21

See your lock instructions for installing lock. Loop cable around frame and insert silver post into lock housing.

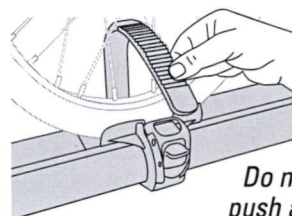


Lock your HighRoller between towers on crossbar when not in use.



22

Pull the strap through wheel spokes.

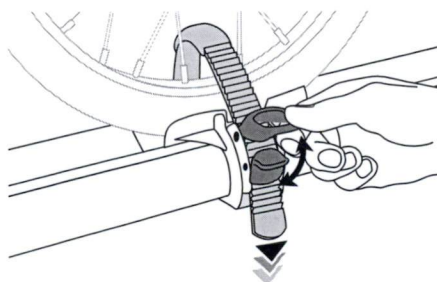


Do not let the strap push against the valve stem.

23

CLOSE THE STRAP.

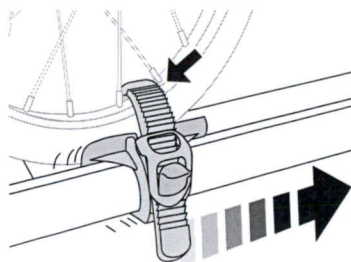
- Insert strap end behind buckle.
- **TIGHTEN** strap by repeatedly lifting buckle.
- **DO NOT OVERTIGHTEN.**



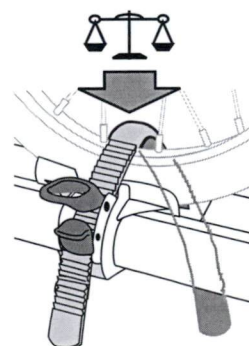
24

CHECK TIRE FOR TIGHT FIT.

- If not tight, loosen strap.
- Adjust position of strap and strap base until strap rests against rim.
- **TIGHTEN** strap again.

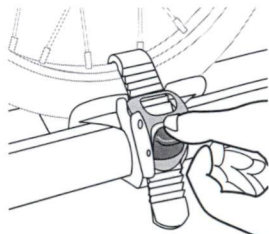


Keep strap centered on small wheels.



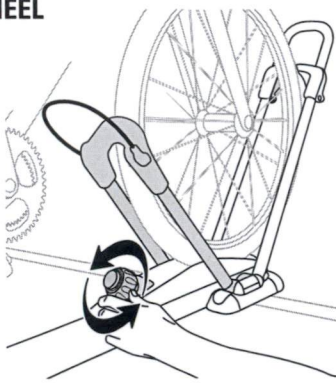
25 UNLOAD BIKE:

To release rear strap, push tab in buckle.



26 FRONT WHEEL

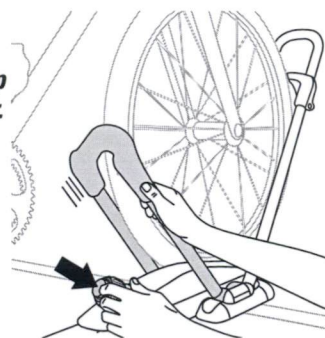
Loosen adjustment knob until small hoop is loosened.



27 SUPPORT SMALL HOOP.

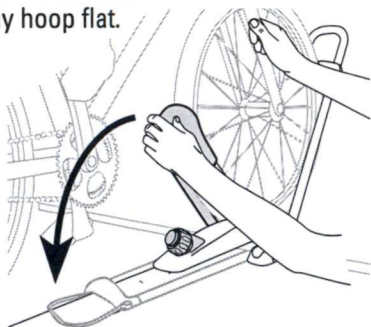
Press red button.

Small hoop will lower.

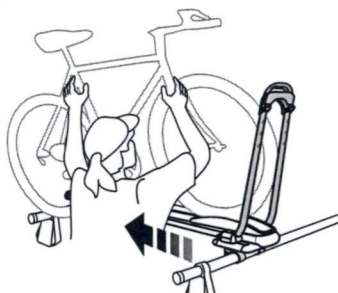


28 SUPPORT BIKE.

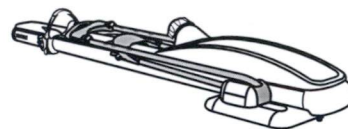
Lay hoop flat.



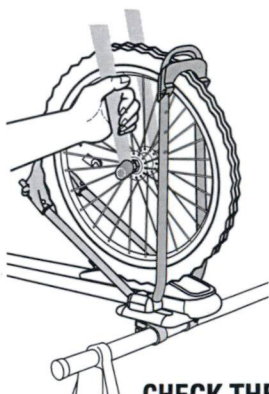
29 Roll back and lift bike out.



Lower both hoops when not in use.



BEFORE DRIVING AWAY:

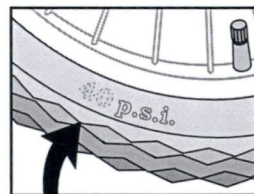
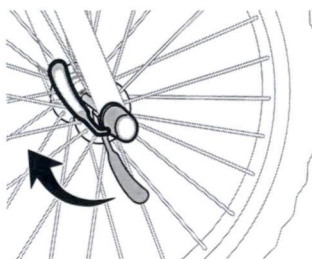


If there is contact, check wheel setting.

CHECK THE FRONT WHEEL.

If it is loose or it moves, be sure knob is tight and wheel is centered!

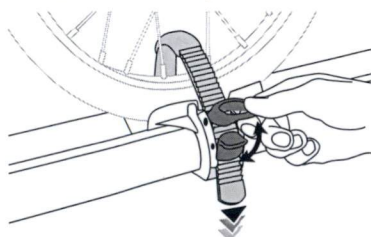
CHECK FRONT WHEEL ATTACHMENT TO BICYCLE FORK.



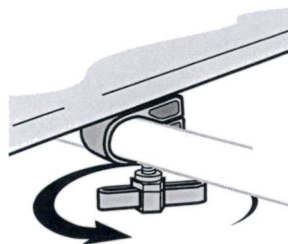
MAKE SURE YOUR TIRES ARE FILLED TO RECOMMENDED PRESSURE FOUND ON THE TIRE.

CHECK THE REAR WHEEL.

Tighten the strap if needed.



DO NOT OVERTIGHTEN THE STRAP!

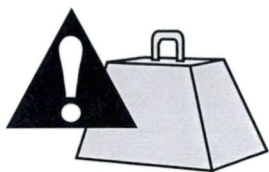


CHECK THE HEX KEY AND THE OBLONG KNOBS.

If they are loose, tighten them.

OFF-ROAD DRIVING

is not recommended and could result in damage to your vehicle or your bike.



WEIGHT LIMITS

Follow the YAKIMA Fit List or your owner's manual for your rack's weight limit. Do not exceed the factory weight limit of your vehicle's racks.

Maximum rack's weight is 165 lbs. (75 kg) unless otherwise noted.



BIKE WEIGHT LIMIT:

MAXIMUM BIKE WEIGHT IS 50 LBS. (23 KG).



DO NOT TRANSPORT BICYCLES WITH ATTACHED BABY SEATS, PANNIERS, WHEEL COVERS, FULL BIKE COVERS OR MOTORS.

IF YOU REMOVE YOUR CARRIER, FOLLOW INSTRUCTIONS TO INSTALL.

Follow safety checks in accessory instructions before every installation.

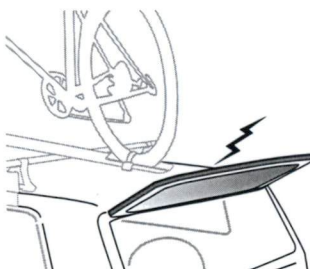


YAKIMA ACCESSORY LOCKS CAN LOCK THE MOUNTS TO THE RACKS
(lock housings purchased separately)

- There must be adequate clearance for installing accessory locks.
- If the accessory lock housing comes in contact with the vehicle, even after loading the rack, do not install them.

REAR HATCH
Some longer loads may prevent the rear hatch from fully opening.

ALWAYS USE CAUTION WHEN OPENING YOUR HATCH.



WARNING

BE SURE ALL HARDWARE IS SECURED ACCORDING TO INSTRUCTIONS. ATTACHMENT HARDWARE CAN LOOSEN OVER TIME. CHECK BEFORE EACH USE, AND TIGHTEN IF NECESSARY.

MAINTENANCE: Use non-water soluble lubricant on screws. Use a soft cloth with water and mild detergent to clean plastic parts.

REMOVE ACCESSORY BEFORE ENTERING AN AUTOMATIC CAR WASH.

TECHNICAL ASSISTANCE OR REPLACEMENT PARTS
Contact your dealer or call
(888)925-4621
Monday through Friday,
7:00 AM to 5:00 PM, PST

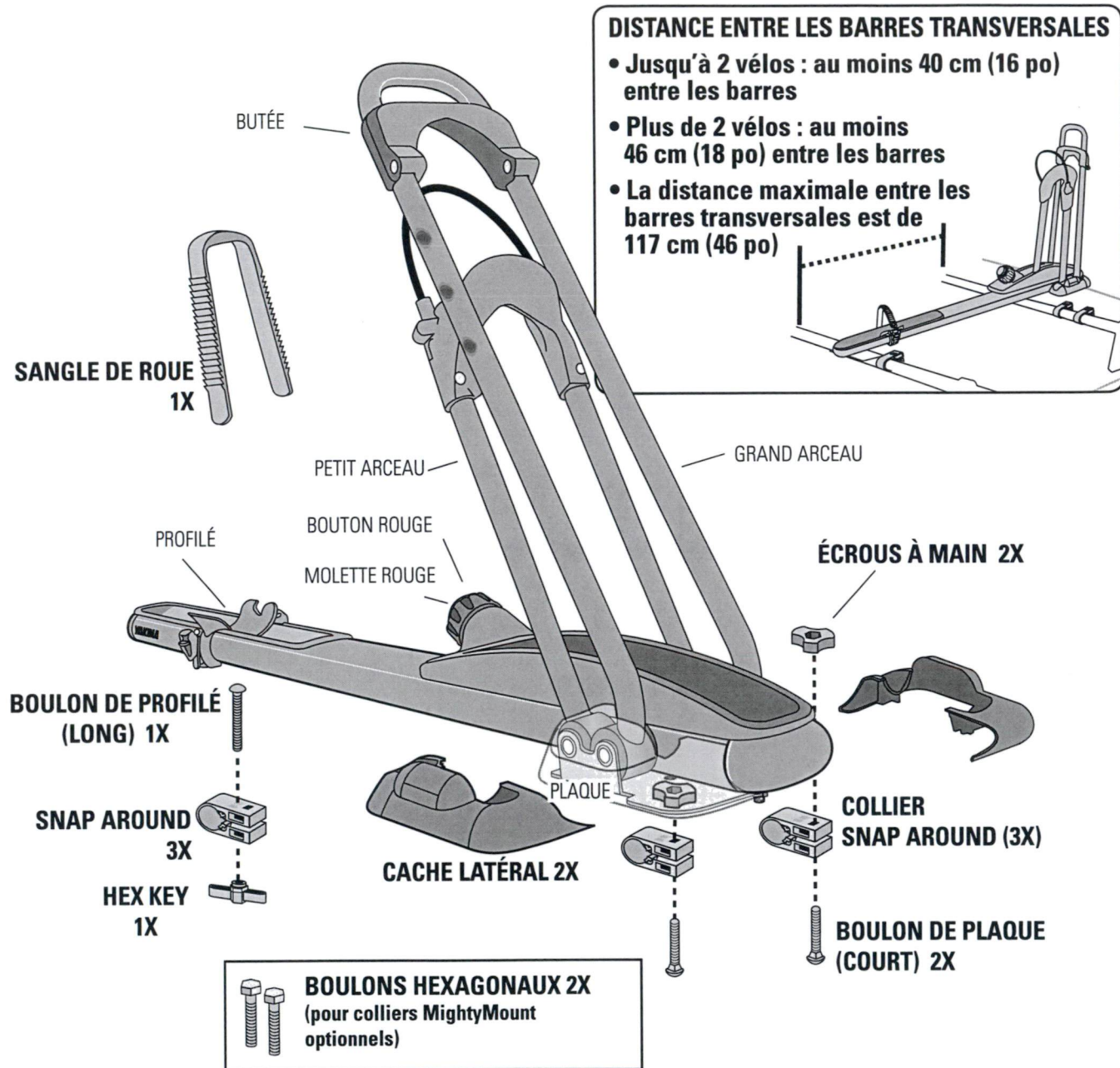


This product is covered by YAKIMA's "Love It Till You Leave It" Limited Lifetime Warranty
To obtain a copy of this warranty, go online to www.yakima.com
or email us at yakwarranty@yakima.com or call (888) 925-4621

KEEP THESE INSTRUCTIONS!

YAKIMA

HIGHROLLER

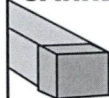
FR

AVERTISSEMENT IMPORTANT

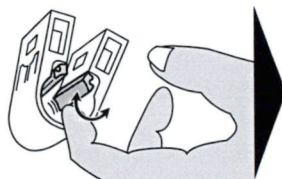
IL EST IMPÉRATIF QUE LES PORTE-BAGAGES ET LES ACCESSOIRES YAKIMA SOIENT CORRECTEMENT ET SOLIDEMENT FIXÉS AU VÉHICULE. UN MONTAGE MAL RÉALISÉ POURRAIT PROVOQUER UN ACCIDENT D'AUTOMOBILE, QUI POURRAIT ENTRAÎNER DES BLESSURES GRAVES OU MÊME LA MORT, À VOUS OU À D'AUTRES PERSONNES. VOUS ÊTES RESPONSABLE DE L'INSTALLATION DU PORTE-BAGAGES ET DES ACCESSOIRES SUR VOTRE VÉHICULE, D'EN VÉRIFIER LA SOLIDITÉ AVANT DE PRENDRE LA ROUTE ET DE LES INSPECTER RÉGULIÈREMENT POUR EN CONTRÔLER L'ÉTAT, L'AJUSTEMENT ET L'USURE. VOUS DEVEZ DONC LIRE ATTENTIVEMENT TOUTES LES INSTRUCTIONS ET TOUS LES AVERTISSEMENTS ACCOMPAGNANT VOTRE PRODUIT YAKIMA AVANT DE L'INSTALLER ET DE L'UTILISER. SI VOUS NE COMPRENEZ PAS TOUTES LES INSTRUCTIONS ET TOUS LES AVERTISSEMENTS, OU SI VOUS N'AVEZ PAS DE COMPÉTENCES EN MÉCANIQUE ET NE COMPRENEZ PAS PARFAITEMENT LA MÉTHODE DE MONTAGE, VOUS DEVRIEZ FAIRE INSTALLER LE PRODUIT PAR UN PROFESSIONNEL, COMME UN MÉCANICIEN OU UN CARROSSIER COMPÉTENT.

AVEZ-VOUS DES BARRES TRANSVERSALES CARRÉES, RONDES OU AUTRES?

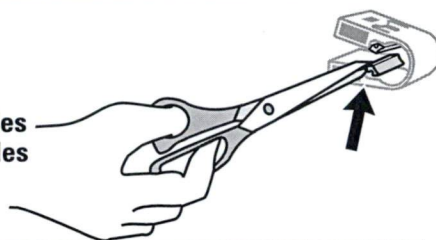
1 BARRES CARRÉES



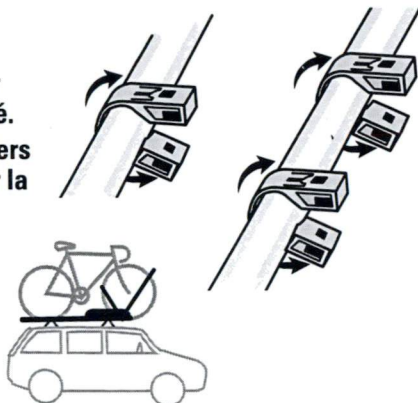
Assouplir les cales en les pliant plusieurs fois.



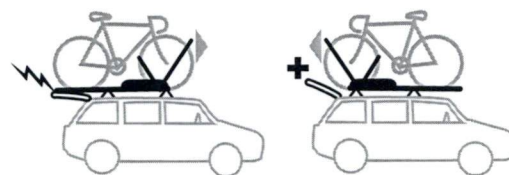
Enlever les cales avec des ciseaux ou des pinces.



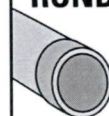
- Enfiler un collier SnapAround pour l'arrière du profilé.
- Enfiler deux colliers SnapAround pour la plaque.



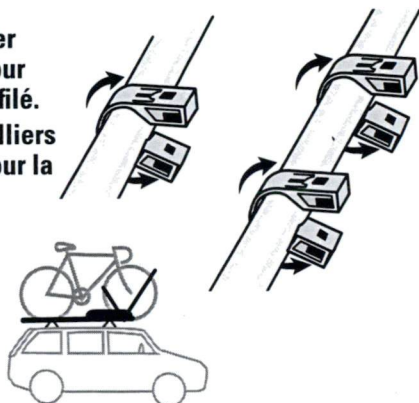
L'OUVERTURE DU HAYON:
On peut poser le Porte-vélo face à l'arrière du véhicule si l'on craint qu'il gêne l'ouverture du hayon.



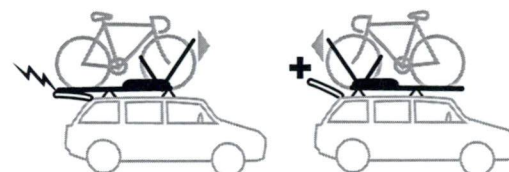
1 BARRES RONDES



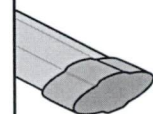
- Enfiler un collier SnapAround pour l'arrière du profilé.
- Enfiler deux colliers SnapAround pour la plaque.



L'OUVERTURE DU HAYON:
On peut poser le Porte-vélo face à l'arrière du véhicule si l'on craint qu'il gêne l'ouverture du hayon.



1 AUTRES

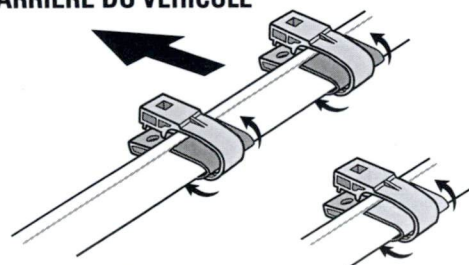


COLLIERS MIGHTYMOUNT:

- Poser deux colliers MightyMount sur la barre arrière et un sur la barre avant.
- S'il faut installer des cales avec les colliers MightyMount, les poser maintenant. Poser les cales métalliques sur la barre transversale arrière (avant du porte-vélo). Suivre ce schéma-ci plutôt que celui des instructions qui accompagnent les colliers MightyMount

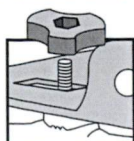


ARRIÈRE DU VÉHICULE



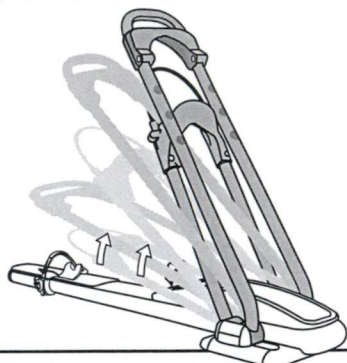
Les colliers MightyMount s'achètent à part (consulter la liste de compatibilité – Fit List – Yakima pour connaître les colliers MightyMount convenant au véhicule).

UNIVERSAL
MIGHTYMOUNT
#03590

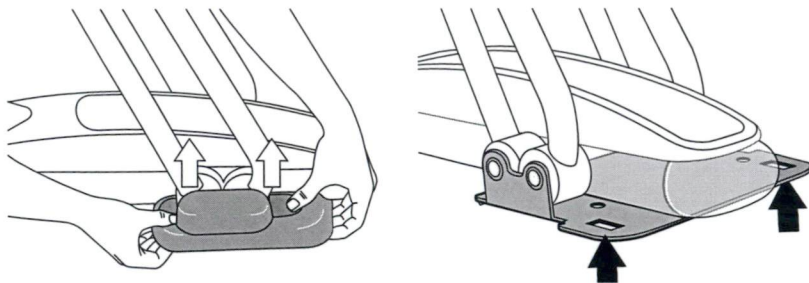


Consulter le mode d'emploi du Universal MightyMount et le présent document concernant HighRoller pour installer correctement votre équipement.

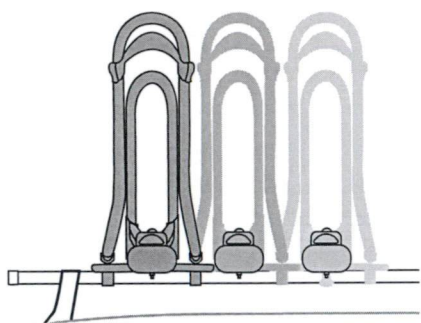
- 2** Relever les deux arceaux jusqu'à ce qu'ils bloquent.



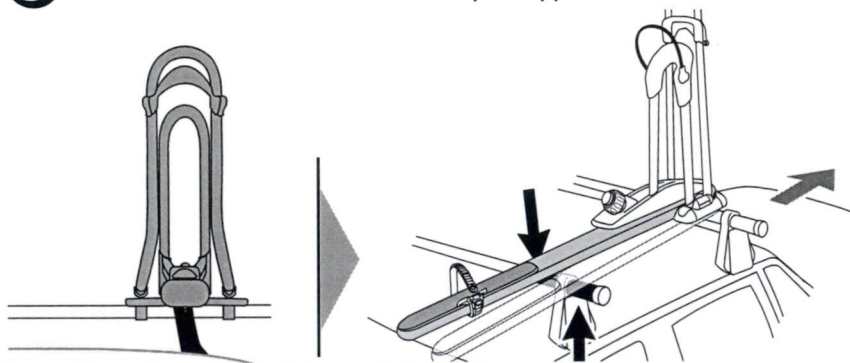
- 3** Enlever les caches latéraux pour atteindre les trous de montage. Appuyer sur les côtés et soulever.



- 4** On peut positionner le porte-vélo où l'on veut sur les barres.



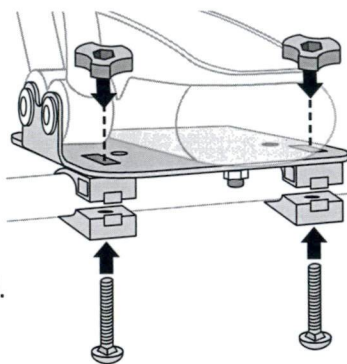
- 5** Si l'on pose l'avant du porte-vélo à cheval sur un pied, le profilé peut être fixé d'un côté ou de l'autre du pied opposé.



6

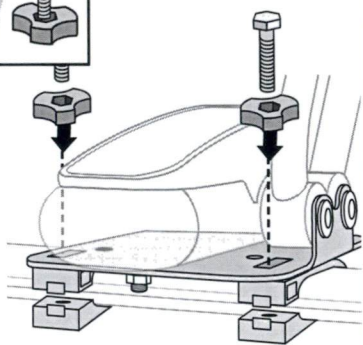
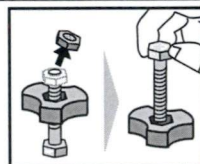
Enfiler les boulons court par le dessous à travers les colliers et dans la plaque.

ENGAGER LES ÉCROUS À MAIN SANS LES SERRER.



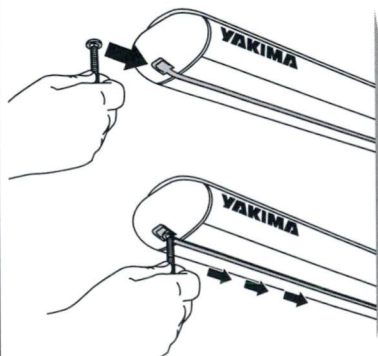
Pour les colliers MightyMounts:

- Enlever l'écrou logé dans le fond du bouton en cuvette.
- Enfoncer un boulon hexagonal par le dessus du bouton en faisant bien pénétrer sa tête.
- Enfiler les boulons court par le dessous à travers la plaque et dans les colliers.
- ENGAGER LES ÉCROUS À MAIN SANS LES SERRER.



7

Enfiler le boulon long dans l'arrière du profilé.

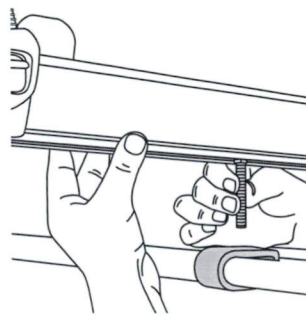


Pour les colliers MightyMounts:

Enlever l'écrou logé dans le fond du collier.



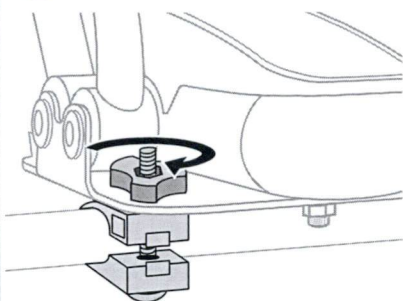
Aligner le boulon avec le trou...



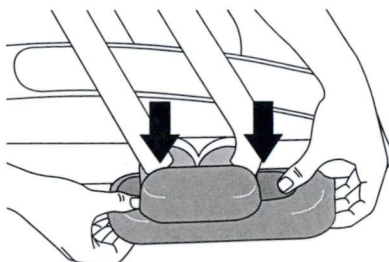
LE FIXER AVEC L'ÉCROU À AILETTES.



8 Serrer les écrous à main.



9 Remettre en place les caches latéraux. (Ils s'emboîtent.)

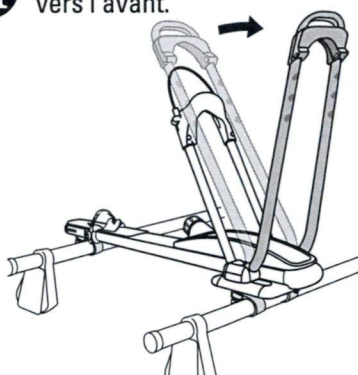


10 **INSTALLER LA SANGLE DE ROUE**

- Enfiler un bout de la sangle dans la fente du côté du profilé opposé à soi.
- Laisser l'autre bout libre.



11 Pencher le grand arceau vers l'avant.

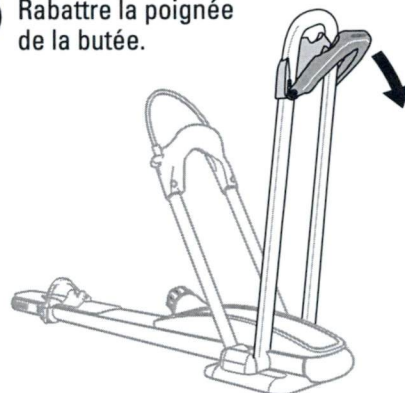


12 Trouver le diamètre de la roue avant du vélo.

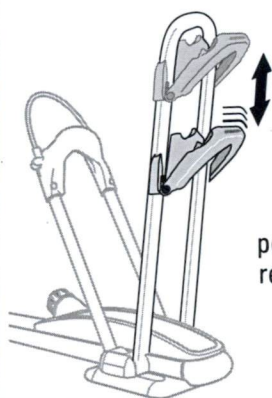


NE PAS EMPLOYER CE PORTE-VÉLO SI LA ROUE MESURE MOINS DE 20 POUCES (51cm).

13 Rabattre la poignée de la butée.



14 Régler la position de la butée pour qu'elle corresponde au diamètre de la roue.



Avec certains pneus tous-terrains, il faudra peut-être choisir un réglage plus élevé.

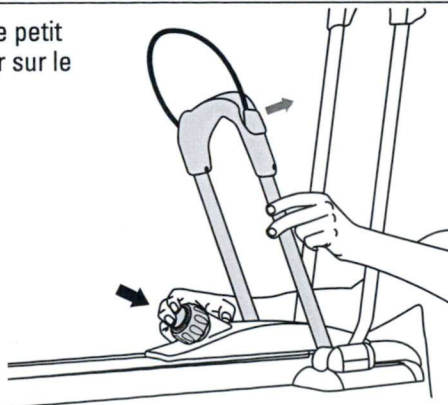


15

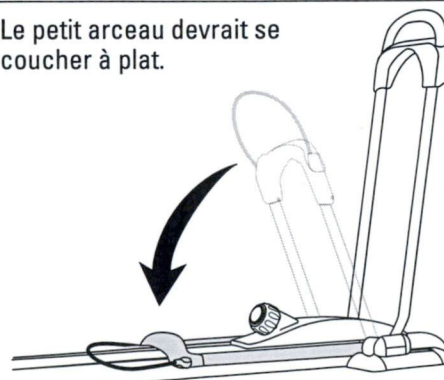


La poignée de la butée doit être alignée sur un chiffre pour pouvoir se rabattre.

16 Tout en tenant le petit arceau, appuyer sur le bouton rouge.



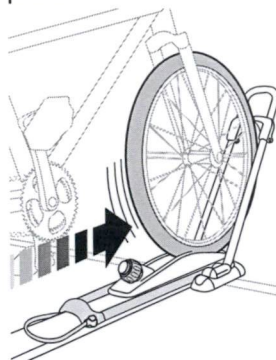
17 Le petit arceau devrait se coucher à plat.



- 18** Soulever le vélo et placer la roue avant dans le profilé avant.



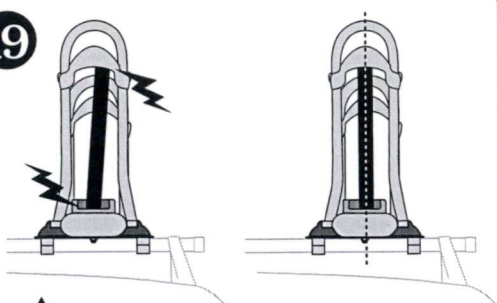
Faire rouler le vélo vers l'avant dans le profilé.



Relever le petit arceau contre le pneu.



19

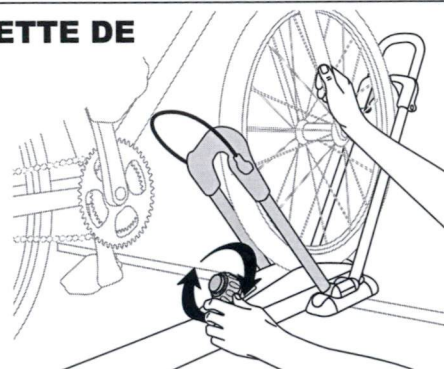


CENTRER LE PNEU SUR SA BUTÉE.

20

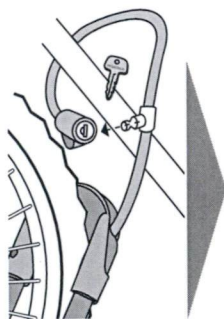
SERRER LA MOLETTE DE RÉGLAGE.

Le petit arceau devrait se serrer contre le pneu. Si la roue bouge, serrer un peu plus.

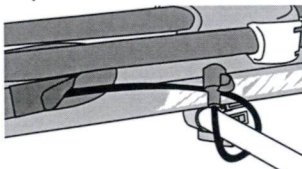


21

Pour poser la serrure, suivre les instructions qui l'accompagnent. Passer le câble autour du cadre et engager l'ergot argenté dans la serrure.

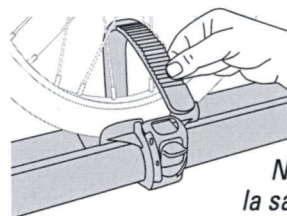


Quand le porte-vélo n'est pas chargé, le verrouiller en passant le câble autour de la barre transversale, entre les pieds.



22

Passer la sangle entre les rayons de la roue arrière.

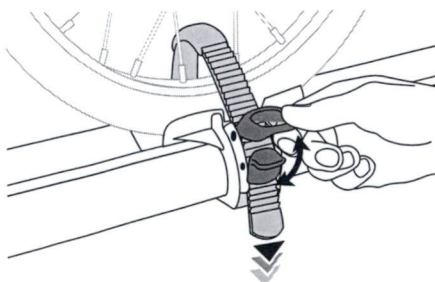


Ne pas appuyer la sangle contre la valve du pneu.

23

BOUCLER LA SANGLE.

- Glisser le bout de la sangle derrière le levier.
- **SERRER** la sangle en relevant le levier plusieurs fois.
- **NE PAS TROP SERRER.**

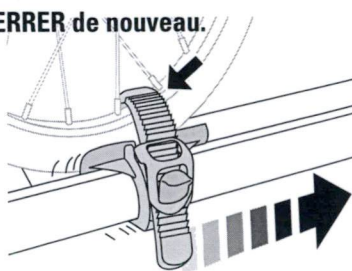


24

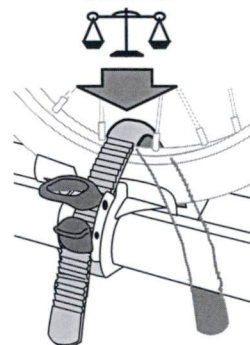
VÉRIFIER QUE LA ROUE EST BIEN

RETENUE.

- Si la roue a du jeu, desserrer la sangle.
- Faire coulisser la sangle le long du profilé jusqu'à ce qu'elle porte contre la jante.
- **SERRER de nouveau.**

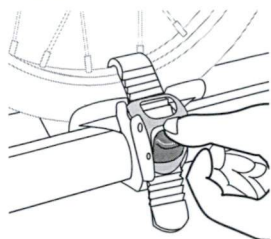


Si la roue est petite, garder la sangle centrée.



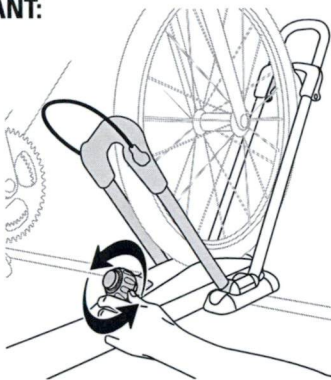
25 POUR DÉCHARGER LE VÉLO:

Pour libérer la sangle arrière, appuyer sur le bouton de la boucle.



26 ROUE AVANT:

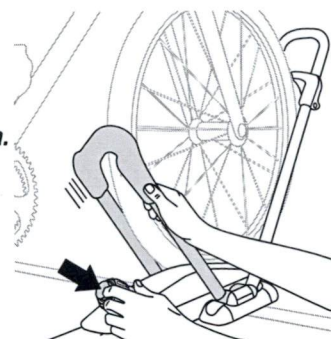
Desserrer la molette de réglage jusqu'à ce que le petit arceau ne porte plus contre le pneu.



27 SOUTENIR LE PETIT ARCEAU .

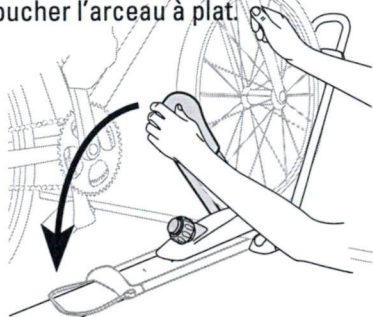
Appuyer sur le bouton rouge.

Le petit arceau s'abaissera.



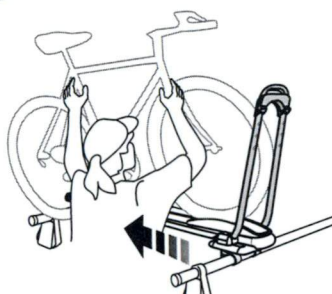
28 SOUTENIR LE VÉLO.

Coucher l'arceau à plat.

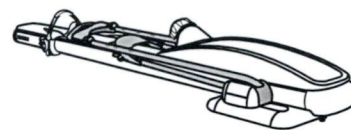


29

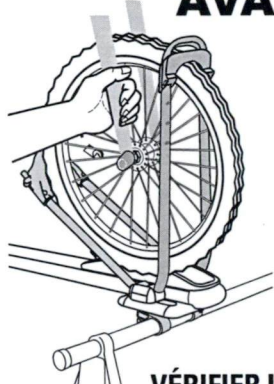
Faire rouler le vélo vers l'arrière et le soulever.



Coucher les deux arceaux quand le porte-vélo n'est pas chargé.



AVANT DE PRENDRE LA ROUTE:

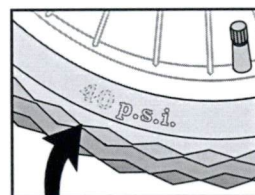
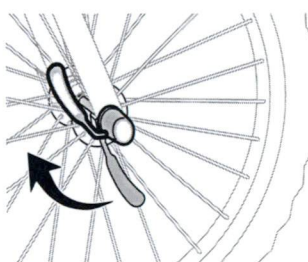


Si la roue touche, vérifier le réglage de la butée.

VÉRIFIER LA ROUE AVANT

Si elle a du jeu ou si elle bouge, vérifier que la molette est serrée et que la roue est centrée!

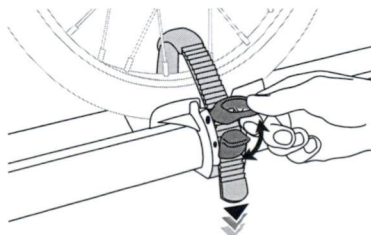
VÉRIFIER LE SERRAGE DE L'AXE DE LA ROUE AVANT.



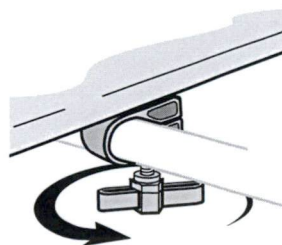
S'ASSURER QUE LES PNEUS SONT GONFLÉS À LA PRESSION RECOMMANDÉE SUR LEUR FLANC.

VÉRIFIER LA ROUE ARRIÈRE.

Serrer la sangle au besoin.



NE PAS TROP SERRER LA SANGLE!



VÉRIFIER L'ÉCROU À AILETTES.

Le serrer au besoin.

LA CONDUITE HORS ROUTE n'est pas recommandée: cela pourrait endommager le véhicule ou le vélo.



LIMITE DE CHARGEMENT

Consulter la liste de compatibilité YAKIMA ("Fit list") ou le manuel du véhicule pour connaître la limite de chargement. Ne pas dépasser la limite de chargement fixée pour le porte-bagages d'origine.

La charge maximale est de 75 kg (165 lb) à moins d'indication contraire.



LIMITE DE POIDS DE VÉLO :

LE CHARGE MAXIMUM DE VÉLO EST DE 23 KG (50 LIVRES).



NE PAS TRANSPORTER DE BICYCLETES MUNIES D'UN SIÈGE DE BÉBÉ, DE SACOCHES, DE HOUSSES DE ROUES, DE HOUSSES DE VÉLO COMPLÈTES OU DE MOTEUR.

SI L'ON ENLÈVE LE PORTE-VÉLO, SUIVRE LES INSTRUCTIONS POUR LE REMETTRE EN PLACE. Effectuer les vérifications de sécurité indiquées dans les instructions-saccompanyant l'accessoire lors de chaque remontage.



UN CADENAS YAKIMA PEUT VERROUILLER LE PORTE-VÉLO AU PORTE-BAGAGES.

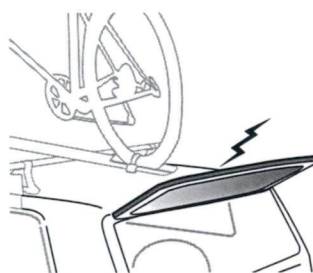
(le cadenas s'achète à part)

- Il doit y avoir suffisamment de place pour poser le cadenas.
- Si le cadenas entre en contact avec le véhicule, même une fois le porte-bagages chargé, ne pas poser le cadenas.

HAYON

Certaines charges longues pourraient empêcher d'ouvrir le hayon complètement.

OUVRIR LE HAYON AVEC PRUDENCE.



AVERTISSEMENT

S'ASSURER QUE LE MONTAGE EST SOLIDE ET CONFORME AUX INSTRUCTIONS. LES DISPOSITIFS DE FIXATION PEUVENT SE DESSERRER À LA LONGUE. LES INSPECTER AVANT CHAQUE UTILISATION ET LES RESSERRER AU BESOIN.

ENTRETIEN: Lubrifier les boulons avec un lubrifiant non soluble à l'eau. Nettoyer les pièces en plastique avec un chiffon, de l'eau et un savon doux.

ENLEVER L'ACCESSOIRE AVANT DE PASSER DANS UN LAVE-AUTO AUTOMATIQUE.

RENSEIGNEMENTS TECHNIQUES COMPLÉMENTAIRES OU DE PIÈCES DE RECHANGE: prière de contacter votre dépositaire ou appelez-nous au (888) 925-4621 du lundi au vendredi, entre 7 heures et 17 heures, heure du Pacifique.



Ce produit est couvert par YAKIMA Garantie à vie limitée «Tant que durera notre histoire d'amour» YAKIMA
Pour obtenir une copie de cette garantie, aller en ligne à www.yakima.com
ou nous envoie un e-mail à yakwarranty@yakima.com ou l'appel (888) 925-4621

CONSERVER CES INSTRUCTIONS!

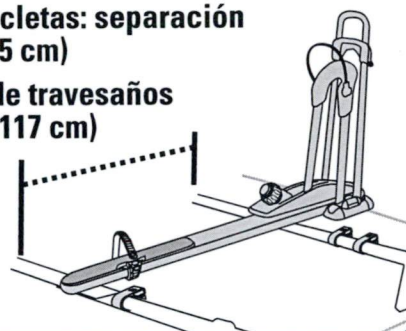
YAKIMA

HIGHROLLER

ES

SEPARACIONES DE TRAVESAÑOS

- Hasta 2 bicicletas: separación mínima 16" (40 cm)
- Más de 2 bicicletas: separación mínima 18" (45 cm)
- Separación de travesaños máxima: 46" (117 cm)



MORDAZA DE RUEDA

CORREA DE RUEDA 1X

ANILLA PEQUEÑA

ANILLA GRANDE

RIEL PARA RUEDA

PERILLA ROJA

BOTÓN ROJO

RUEDITAS MANUALES 2X

TORNILLO DEL RIEL PARA RUEDA (MÁS LARGO) 1X

SNAP AROUND 3X

TUERCA HEXAGONAL 1X

CUBIERTA DE PLACA BASE 2X

PLACA BASE

SNAP AROUND (3X)

TORNILLOS DE PLACA BASE (MÁS CORTOS) 2X

PERNOS DE CABEZA HEXAGONAL 2X
(para partes MightyMount opcionales)

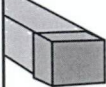


AVISO IMPORTANTE!

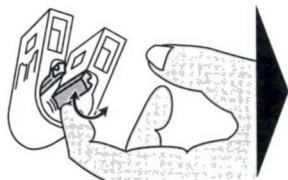
ES FUNDAMENTAL QUE TODAS LAS PARRILLAS Y ACCESORIOS YAKIMA ESTÉN BIEN COLOCADOS Y ASEGURADOS AL VEHÍCULO. UNA INSTALACIÓN DEFICIENTE PODRÍA RESULTAR EN ACCIDENTE AUTOMOVILÍSTICO Y PROVOCAR HERIDAS GRAVES O MUERTE A USTED O A TERCEROS. USTED ES RESPONSABLE DE ASEGURAR LAS PARRILLAS Y ACCESORIOS AL VEHÍCULO, VERIFICANDO UNIONES Y AMARRES ANTES DE USAR E INSPECCIONANDO EL AJUSTE DE LOS PRODUCTOS, SU DESGASTE Y POSIBLES DAÑOS. POR ELLO DEBE LEER Y COMPRENDER TODAS LAS INSTRUCCIONES Y ADVERTENCIAS QUE VIENEN CON LOS PRODUCTOS YAKIMA ANTES DE INSTALARLOS O USARLOS. SI NO ENTIENDE TODAS LAS INSTRUCCIONES Y ADVERTENCIAS, O NO TIENE EXPERIENCIA EN MECÁNICA O NO ESTÁ FAMILIARIZADO CON LOS PROCEDIMIENTOS DE INSTALACIÓN, HAGA INSTALAR EL PRODUCTO POR UN PROFESIONAL EN UN GARAGE CONOCIDO O EN UN TALLER DE CARROCERÍA.

¿TIENE BARRAS CUADRADAS, REDONDAS, TRAVESAÑOS U OTRAS BARRAS?

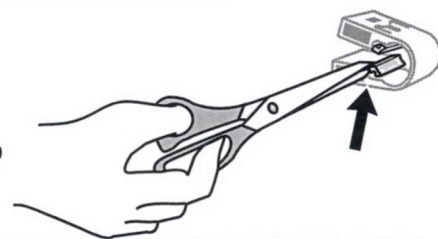
1 TRAVESAÑOS CUADRADOS



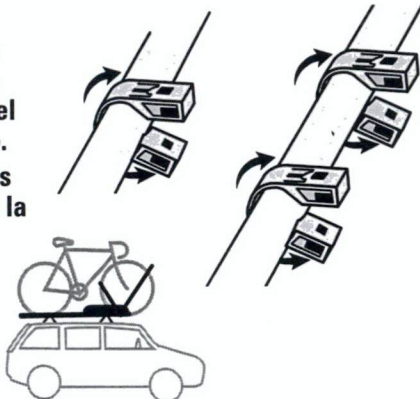
Afloje las orejuelas
doblándolas
repetidamente.



Quite las
orejuelas
con tijeras o
pinzas.

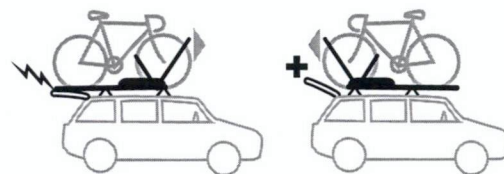


- Coloque 1 broche SnapAround para el riel de rueda del travesaño trasero.
- Coloque 2 broches SnapAround para la placa base.

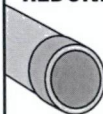


INTERFERENCIA CON LA PORTEZUELA POSTERIOR:

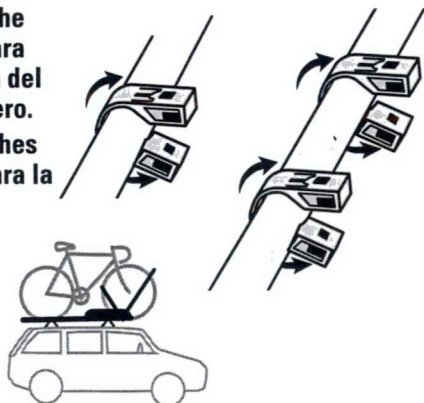
El portabicicletas HighRoller puede orientarse en sentido contrario si hay interferencia con la portezuela posterior.



1 TRAVESAÑOS REDONDOS

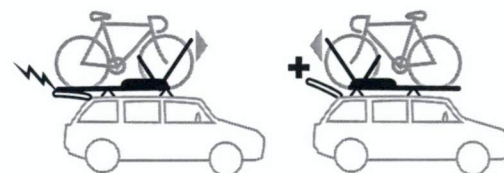


- Coloque 1 broche SnapAround para el riel de rueda del travesaño trasero.
- Coloque 2 broches SnapAround para la placa base.

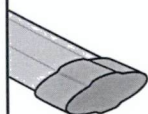


INTERFERENCIA CON LA PORTEZUELA POSTERIOR:

El portabicicletas HighRoller puede orientarse en sentido contrario si hay interferencia con la portezuela posterior.



1 OTRAS

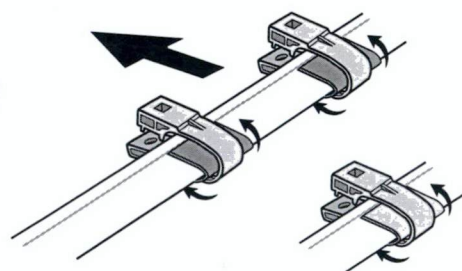


OTRAS BROCHES MIGHTYMOUNTS:

- Coloque dos (2) broches MightyMounts en la barra trasera y un (1) broche en la barra delantera.
- Si los broches MightyMounts necesitan protectores de barra, instálelos ahora. Debe colocar protectores de barra metálicos a la barra transversal trasera (parte delantera del montaje). Remítase a este diagrama en lugar de las instrucciones de los broches MightyMounts.



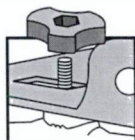
PARTE TRASERA DEL VEHÍCULO



Los broches MightyMounts se venden por separado.

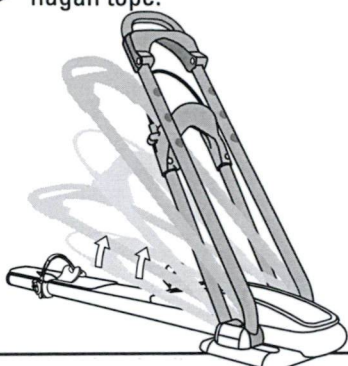
(Remítase a la Guía de Uso de YAKIMA para informarse sobre los broches más adecuados para su vehículo).

UNIVERSAL
MIGHTYMOUNT
#03590

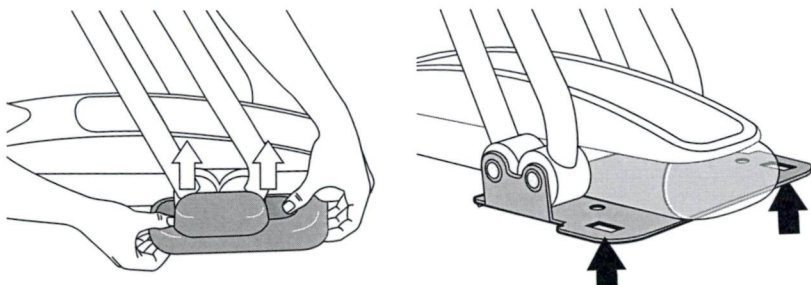


Para una correcta instalación, siga las indicaciones de los broches universales MightyMount y remítase a las instrucciones del HighRoller.

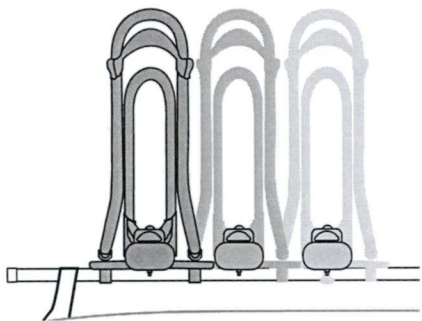
- 2** Levante ambas anillas hasta que hagan tope.



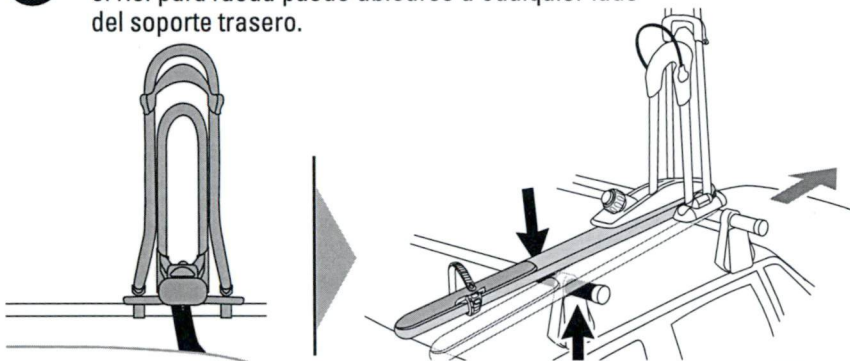
- 3** Quite la cubierta de placa base. Presione los lados y levante para descubrir los agujeros de los tornillos.



- 4** Coloque el armazón en cualquier lugar sobre el travesaño.

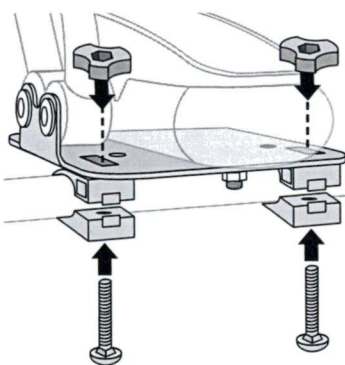


- 5** Si coloca el armazón delantero sobre un soporte, el riel para rueda puede ubicarse a cualquier lado del soporte trasero.



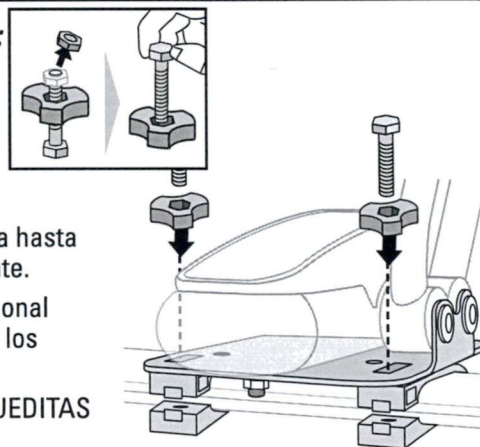
- 6** Inserte los tornillos cortos de placa base largos desde abajo en los SnapAround y la placa.

COLOQUE FLOJAS LAS RUEDITAS MANUALES.

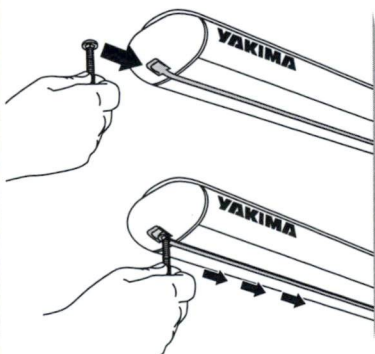


Usuarios de MightyMounts:

- Quite la tuerca incorporada en la rueditas manuales.
- Empuje el pernos de cabeza hexagonal por la parte superior de la perilla hasta introducirlo completamente.
- Inserte los tornillos hexagonal desde abajo en la placa y los MightyMounts.
- COLOQUE FLOJAS LAS RUEDITAS MANUALES.

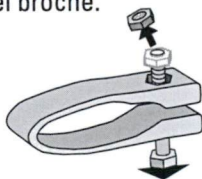


- 7** Deslice el tornillo largo por el extremo final del riel para rueda.

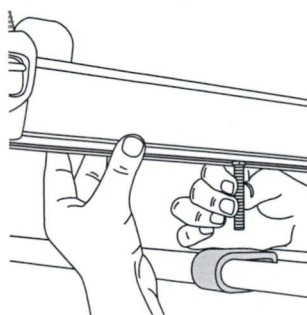


Usuarios de MightyMounts:

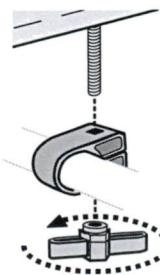
Quite la tuerca incorporada en el broche.



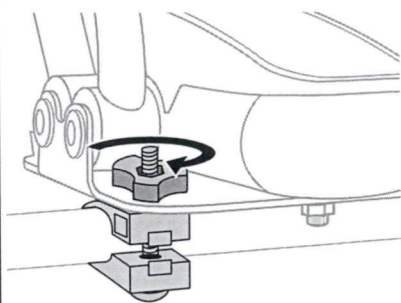
Haga corresponder el tornillo con el agujero...



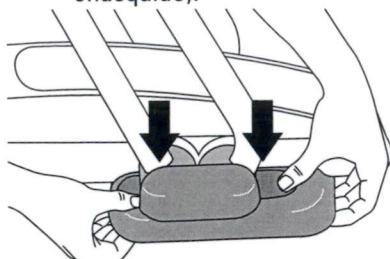
ASEGURE CON LA TUERCA HEXAGONAL.



8 Ajuste las rueditas manuales.



9 Vuelva a colocar las cubiertas de placa base. (Deben cerrar con un chasquido).

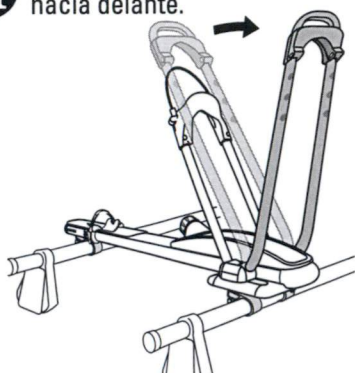


10 **COLOQUE LA CORREA DE RUEDA**

- Inserte un extremo de la correa en la ranura del lado alejado del riel.
- Deje libre el otro extremo.



11 Mueva la anilla grande hacia delante.



12 Vea el tamaño de neumático de la rueda delantera.

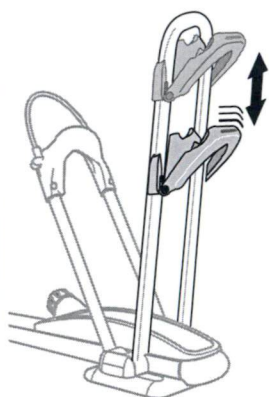


NO USE EL ARMAZÓN CON RUEDAS DE MENOS DE 20" (51cm)

13 Abra la palanca de la mordaza de rueda.



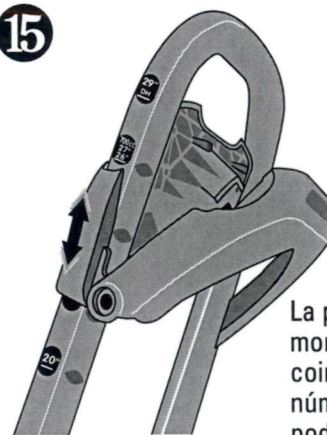
14 Deslice la mordaza hasta que corresponda al tamaño de neumático.



Algunos neumáticos de bicicleta de montaña pueden exigir un reglaje más alto.

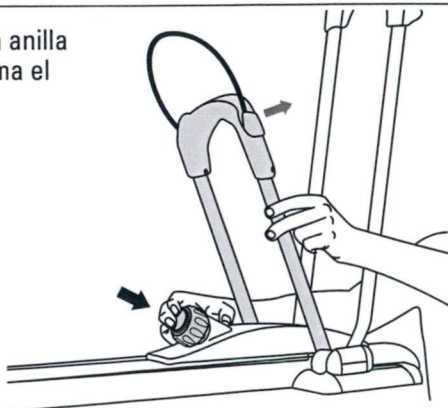


15

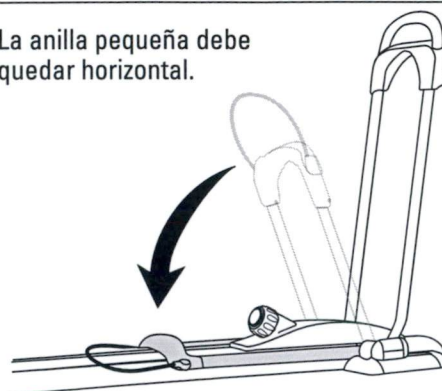


La palanca de la mordaza debe coincidir con un número antes de poder cerrar.

16 Sosteniendo la anilla pequeña, oprima el botón rojo.



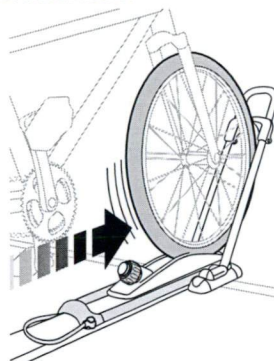
17 La anilla pequeña debe quedar horizontal.



- 18** Levante la bicicleta y coloque la rueda delantera en la anilla pequeña.



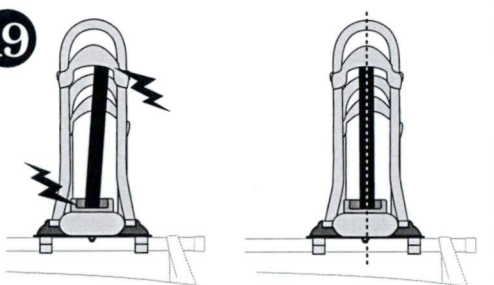
Ruede la bicicleta hacia delante en el riel delantero.



Levante la anilla pequeña contra el neumático.



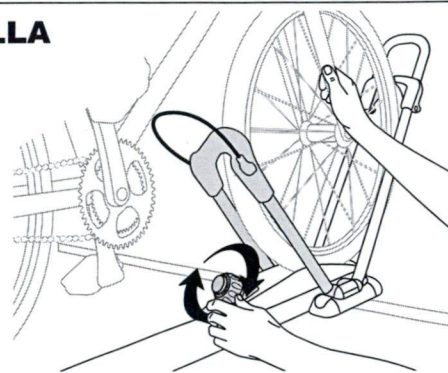
19



! CENTRE EL NEUMÁTICO EN LA MORDAZA.

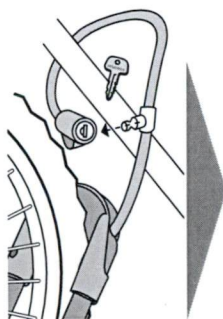
20 AJUSTE LA PERILLA

La anilla pequeña debe presionar sobre el neumático. Si la rueda se mueve, ajuste más.

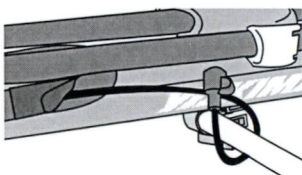


21

Vea las instrucciones para instalar el cerrojo. Enrosque el cable alrededor del cuadro e inserte el perno plateado en la caja del cerrojo.

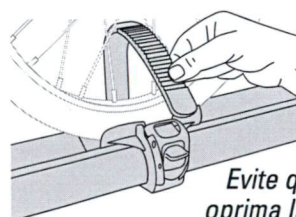


Cierre con llave el HighRoller entre los soportes del travesaño cuando no lo utilice.



22

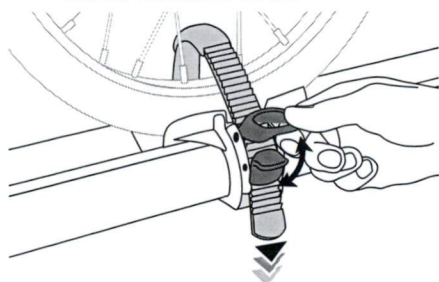
Pase la correa por los rayos de la rueda.



Evite que la correa oprima la válvula.

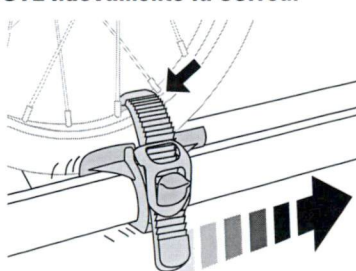
23 CIERRE LA CORREA.

- Inserte el extremo de la correa detrás de la hebilla.
- **AJUSTE** la correa levantando repetidamente la hebilla.
- **NO AJUSTE DE MÁS.**

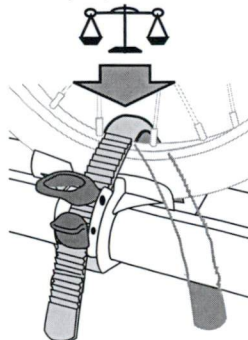


24 VERIFIQUE QUE EL NEUMÁTICO ESTA FIRME.

- Si no está firme, afloje la correa.
- Ajuste la posición de la correa y de su base hasta que la correa se apoye en la llanta.
- **AJUSTE nuevamente la correa.**

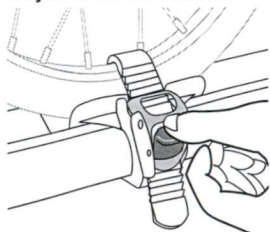


Mantenga el centrado para ruedas pequeñas.



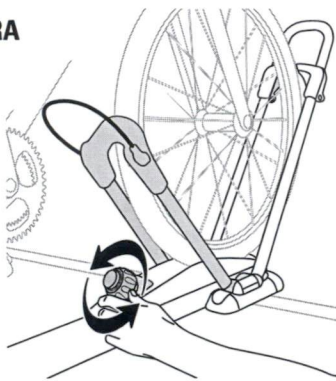
25 DESCARGUE LA BICICLETA:

Para soltar la correa trasera, oprima la orejuela de la hebilla.



26 RUEDA DELANTERA

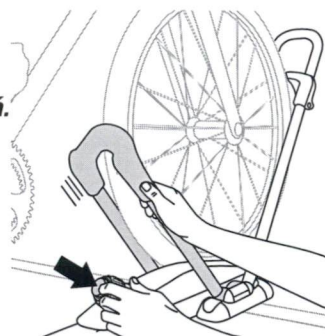
Afloje la perilla de ajuste hasta liberar la anilla pequeña.



27 SOSTENGA LA ANILLA PEQUEÑA.

Oprima el botón rojo.

La anilla pequeña descenderá.

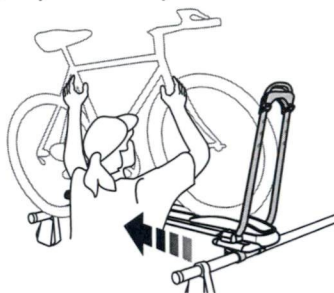


28 SOSTENGA LA BICICLETA.

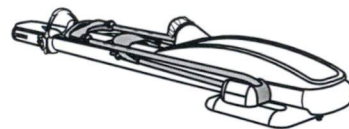
Coloque la anilla en posición horizontal.



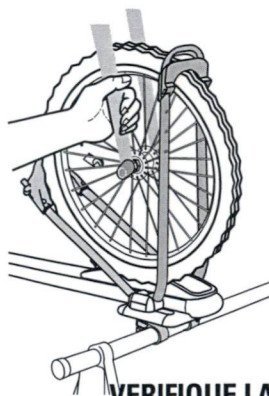
29 Ruede la bicicleta hacia atrás y levántela para sacarla.



Mantenga bajas ambas anillas cuando no las use.



ANTES DE PARTIR:

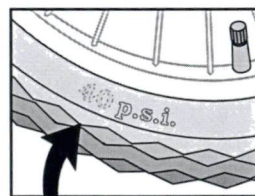
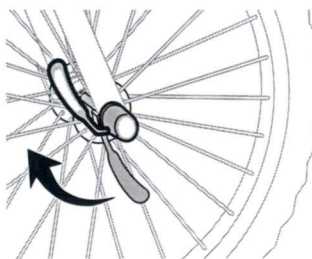


Si hay contacto verifique el reglaje de la rueda.

VERIFIQUE LA RUEDA DELANTERA

¡Si está floja o se mueve, asegúrese de que la perilla está ajustada y la rueda está centrada!

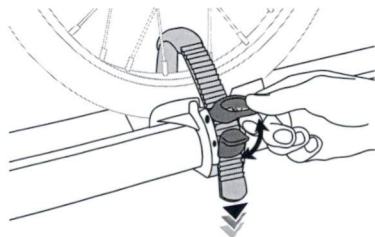
VERIFIQUE EL AJUSTE DE LA RUEDA DELANTERA A LA HORQUILLA DE LA BICICLETA.



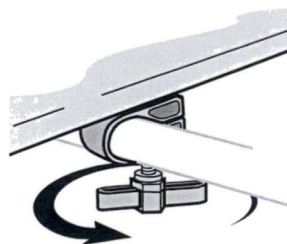
ASEGÚRESE DE QUE LOS NEUMÁTICOS ESTÁN INFLADOS A LA PRESIÓN RECOMENDADA INDICADA EN EL NEUMÁTICO.

VERIFIQUE LA RUEDA TRASERA

Ajuste la correa si es necesario.



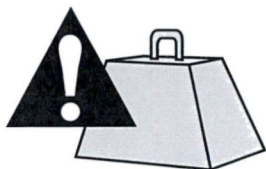
¡NO AJUSTE DE MÁS LA CORREA!



VERIFIQUE LA TUERCA HEXAGONAL Y LAS PERILLAS OBLONGAS.

Si están flojas, ajústelas.

No se recomienda CONducir FUERA DE LA RUTA pues podría dañarse el vehículo o la bicicleta.



LÍMITES DE PESO

Busque el límite de peso de su parrilla en la Lista de compatibilidad Yakima o manual del propietario. No exceda el límite de peso de fábrica de la parrilla de su vehículo.

El peso máximo es 165 lbs (75 kg) salvo indicación en contrario.



LÍMITE DE PESO DE LA BICICLETA:

EL PESO MÁXIMO DE LA BICICLETA ES 50 LIBRAS (23 KG).



NO TRANSPORTE BICICLETAS CON ASIENTOS PARA BEBÉS, CESTAS, GUARDABARROS, CUBREBICICLETAS O MOTORES.

SI QUITA EL ACCESORIO, SIGA LAS INSTRUCCIONES

PARA VOLVER A INSTALARLO. Haga las verificaciones de seguridad de las instrucciones para el accesorio antes de cada instalación.



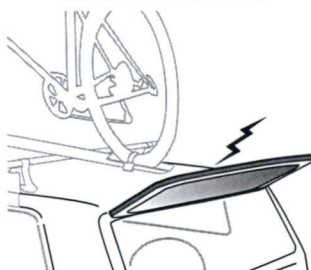
LOS CERROJOS ACCESORIOS YAKIMA PUEDEN TRANCAR EL ARMAZÓN A LA PARRILLA
(se compran por separado)

- Debe haber suficiente espacio para instalar los cerrojos.
- Si el cerrojo toca el vehículo, aún después de cargar la parrilla, no lo instale.

PORTEZUELA TRASERA

Algunas cargas largas pueden impedir que la portezuela trasera se abra completamente.

SIEMPRE PROCEDA CON CUIDADO AL ABRIR LA PORTEZUELA.



ADVERTENCIA

CERCIÓRESE DE QUE TODO EL EQUIPO QUEDÓ ASEGURADO SEGÚN LAS INSTRUCCIONES. LAS UNIONES Y PIEZAS DE MONTAJE PUEDEN AFLOJARSE CON EL TIEMPO. VERIFIQUE ANTES DE CADA USO Y AJUSTE SI ES NECESARIO.

MANTENIMIENTO: Use lubricante no soluble en agua en los tornillos. Use un paño blando con agua y detergente suave para limpiar las partes de plástico.

QUITE EL ACCESORIO ANTES DE ENTRAR EN UN LAVADERO AUTOMÁTICO DE VEHÍCULOS.

ASISTENCIA TÉCNICA O REPUESTOS

Comuníquese con su distribuidor o llame al (888)925-4621

de lunes a viernes, de 7:00 AM a 5:00 PM hora del Pacífico.



Este producto está cubierto por la garantía limitada a vida "mientras dure el romance" de YAKIMA.

Para obtener una copia de la garantía limitada, va en línea a www.yakima.com o nos manda correo electrónico en yakwarranty@yakima.com o llamada (888) 925-4621

¡CONSERVE ESTAS INSTRUCCIONES!

YAKIMA

À LIRE D'ABORD !

POUR VOTRE SÉCURITÉ

Pour les fins de la garantie, inscrivez votre nouveau produit en ligne au www.yakima.com
Changez l'avenir ! Pour recevoir des articles promotionnels ou des produits gratuits allez au www.yakima.com/research



TOUT D'ABORD : MERCI !

Bienvenue dans la famille Yakima. Nous vous remercions de votre appui et nous sommes sûrs que votre nouveau produit Yakima vous donnera des années de bon rendement. Nous vous offrons ici quelques conseils pour faire en sorte que vous soyez entièrement satisfait de votre achat.

RECHERCHEZ CES SYMBOLES !



=

SÉCURITÉ : pour votre sécurité, lisez les avertissements importants figurant dans les instructions accompagnant le produit. Ce symbole identifie les avertissements de sécurité.



=

ARRÊTEZ : veuillez lire toutes les notes importantes concernant le produit figurant dans les instructions qui l'accompagnent. Elles vous aideront à bien l'installer et l'ajuster et sont identifiées par ce symbole.

NE FORCEZ PAS !

À cause de variantes dans la construction des véhicules, il est possible que certaines pièces fournies ne s'ajustent pas exactement de la même manière sur votre véhicule que sur nos véhicules d'essai. Même si nous avons effectué des recherches approfondies pour offrir en toute confiance les porte-bagages et les accessoires Yakima convenant le mieux à votre véhicule, il n'en demeure pas moins que Yakima n'est pas responsable du montage de ses produits sur le véhicule, non plus que de dommages qui pourraient résulter de leur mise en place, installation ou utilisation. Si une pièce ne semble pas convenir au véhicule, n'essayez pas de la forcer en place. La responsabilité du fabricant se limite au prix payé pour la marchandise qui se révélerait présenter un vice de matériau ou de fabrication.

CHOSSES À FAIRE... ET À NE PAS FAIRE

CHOSSES À FAIRE

- ☒ Respecter les instructions et les avertissements détaillés d'installation.
- ☒ Arrimer les charges longues ou larges à l'avant et à l'arrière de la charge. Si la charge semble pouvoir partir au vent... elle va le faire ! ATTACHEZ-LA !
- ☒ Vérifier la quincaillerie, les sangles, le porte-bagage d'origine et tout ce qui peut se desserrer : tout doit être solide et bien serré. Répéter cette inspection tous les 500 – 700 km, ou si l'on a roulé sur des routes cahoteuses, par mauvais temps ou s'il vente fort.
- ☒ N'employer les accessoires Yakima que pour ce pour quoi ils sont conçus.

CHOSSES À NE PAS FAIRE

- ☐ Ne pas transporter des objets instables ou de forme irrégulière comme des meubles, des matelas ou tout autre charge qui ne peut pas être solidement arrimée.
- ☐ Ne pas découper ou modifier le porte-bagage ou ses accessoires.
- ☐ Ne pas dépasser la charge maximale spécifiée par le constructeur du véhicule.
- ☐ Ne pas surcharger le porte-bagage ou ses accessoires.
- ☐ Ne pas employer le porte-bagage hors route.



AVERTISSEMENT: s'assurer que le montage est solide et conforme aux instructions. Les dispositifs de fixation peuvent se desserrer à la longue. Les inspecter avant chaque utilisation et les resserrer au besoin.

ENTRETIEN : lubrifier les vis avec un lubrifiant non soluble à l'eau. Nettoyer les pièces en plastique avec un chiffon, de l'eau et un savon doux.

ENLEVER L'ACCESSOIRE AVANT DE PASSER DANS UN LAVE-AUTO AUTOMATIQUE.

POUR OBTENIR DES RENSEIGNEMENTS TECHNIQUES OU DES PIÈCES DE RECHANGE prière de contacter votre dépositaire, de consulter le site www.yakima.com ou d'appeler au (888) 925-4621, du lundi au vendredi, entre 7 heures et 17 heures, heure du Pacifique.

AVERTISSEMENT IMPORTANT:

il est impératif que les porte-bagages et les accessoires Yakima soient correctement et solidement fixés au véhicule. Un montage mal réalisé pourrait provoquer un accident d'automobile, qui pourrait entraîner des blessures graves ou même la mort, à vous ou à d'autres personnes. Vous êtes responsable de l'installation du porte-bagages et des accessoires sur votre véhicule, d'en vérifier la solidité avant de prendre la route et de les inspecter régulièrement pour en contrôler l'état, l'ajustement et l'usure. Vous devez donc lire attentivement toutes les instructions et tous les avertissements accompagnant votre produit Yakima avant de l'installer et de l'utiliser. Si vous ne comprenez pas toutes les instructions et tous les avertissements, ou si vous n'avez pas de compétences en mécanique et ne comprenez pas parfaitement la méthode de montage, vous devriez faire installer le produit par un professionnel, comme un mécanicien ou un carrossier compétent.



VOUS POUVEZ COMPTER SUR NOUS

La présente garantie à vie limitée couvre tous les produits* et composantes de porte-bagage de marque Yakima fabriqués par Yakima Products, Inc. (Yakima), et demeure en vigueur tant que l'acheteur au détail d'origine est propriétaire du produit. Cette garantie prend fin quand l'acheteur au détail d'origine vend ou cède d'une autre façon le produit à une autre personne.

Sous réserve de l'inspection du produit par Yakima et des limitations et exclusions décrites ici, Yakima corrigera les vices de matériau ou de fabrication en réparant ou en remplaçant, au choix de Yakima, le produit défectueux sans frais pour les pièces ou la main d'œuvre. Yakima peut décider, à sa discrétion, de ne pas réparer ou remplacer le produit défectueux; dans ce cas Yakima remettra à l'acheteur au détail d'origine, à la discrétion de Yakima, soit un remboursement correspondant au prix d'achat du produit, soit un crédit applicable à l'achat de produits ou de composantes de porte-bagage Yakima neufs.

Cette garantie ne couvre pas l'usure normale (comme entre autres les égratignures, les bosses, les déchirures ou l'oxydation superficielle, ou la dégradation naturelle des couleurs ou des matériaux causée par le temps et une utilisation prolongée), l'utilisation commerciale ou les dommages résultant d'un accident, de l'utilisation illégale du véhicule ou de modifications ou réparations non exécutées ou autorisées par Yakima.

De plus, cette garantie ne couvre pas les dommages consécutifs à des situations sur lesquelles Yakima n'a aucun contrôle, comme, entre autres, le vol, une mauvaise utilisation et la surcharge, ou consécutifs à un assemblage, une installation ou une utilisation du produit ne correspondant pas aux instructions écrites de Yakima fournies avec le produit ou communiquées à l'acheteur au détail d'origine.

S'il estime que son produit Yakima est défectueux, l'acheteur au détail d'origine doit s'adresser au dépositaire Yakima chez qui le produit a été acheté; celui-ci indiquera au client comment procéder. Si l'acheteur au détail d'origine ne peut communiquer avec le dépositaire Yakima, ou si le dépositaire ne peut corriger le défaut, l'acheteur au détail d'origine doit communiquer avec Yakima par courriel à : yakwarranty@yakima.com, ou par téléphone au (888) 925-4621 pour obtenir des instructions d'expédition.

Si l'acheteur au détail d'origine contacte Yakima directement, un technicien de Yakima lui indiquera la manière de retourner le produit à Yakima. L'acheteur au détail d'origine devra assumer les frais de transport jusqu'à Yakima. Afin de pouvoir se prévaloir de cette garantie (soit d'un dépositaire Yakima, soit directement de Yakima), il est obligatoire de présenter une preuve d'achat, sous forme soit de la facture originale soit du reçu original. Cette garantie couvre tous les produits fabriqués après le 1er janvier 2006.

LIMITATION DE RESPONSABILITÉ

AUX TERMES DE CETTE GARANTIE, LA COMPENSATION OFFERTE À L'ACHETEUR AU DÉTAIL D'ORIGINE SE LIMITE À LA RÉPARATION OU AU REMPLACEMENT D'UN PRODUIT DÉFECTUEUX, OU À LA REMISE D'UN REMBOURSEMENT OU D'UN CRÉDIT (AU CHOIX DE YAKIMA). CETTE GARANTIE NE COUVRE PAS LES DOMMAGES OU LES BLESSURES QUE POURRAIT AVOIR SUBI L'ACHETEUR AU DÉTAIL D'ORIGINE, SON VÉHICULE, LA CARGAISON OU SES BIENS, OU TOUTE AUTRE PERSONNE OU BIEN.

CETTE GARANTIE REMPLACE EXPRESSÉMENT TOUTE AUTRE GARANTIE EXPRIMÉE DE MANIÈRE ORALE OU ÉCRITE.

LA RESPONSABILITÉ DE YAKIMA SE LIMITE À LA COMPENSATION OFFERTE CI-DESSUS. YAKIMA NE SERA EN AUCUN CAS RESPONSABLE DE DOMMAGES DIRECTS, INDIRECTS, ACCESSOIRES, PARTICULIERS, EXEMPLAIRES OU PUNITIFS OU DE TOUTE AUTRE NATURE (COMME, ENTRE AUTRES, LA PERTE DE BÉNÉFICES OU DE VENTES).

CERTAINES JURIDICTIONS NE PERMETTENT PAS L'EXCLUSION OU LA LIMITATION DES DOMMAGES ACCESSOIRES OU INDIRECTS, ET LES LIMITATIONS CI-DESSUS NE S'APPLIQUENT DONC PEUT-ÊTRE PAS À VOUS.

CETTE GARANTIE VOUS DONNE DES DROITS JURIDIQUES SPÉCIFIQUES ET VOUS POUVEZ AUSSI AVOIR D'AUTRES DROITS, QUI VARIENT SELON LES JURIDICTIONS.

Vous pouvez contacter Yakima par courriel à yakwarranty@yakima.com, ou par téléphone au (888) 925-4621.

YAKIMA ¡LÉAME PRIMERO!

PARA SU SEGURIDAD

Complete en línea el registro de garantía de su nuevo producto: www.yakima.com
¡Cambie el futuro! Para recibir artículos de promoción y productos gratis, visite www.yakima.com/research



ANTES QUE NADA, ¡GRACIAS!

Bienvenido a la familia Yakima. Apreciamos su confianza y estamos seguros de que usted logrará años de sólidos resultados con su nuevo producto Yakima. Más abajo encontrará pistas útiles para que se sienta totalmente satisfecho de su compra.

¡RETENGA ESTOS SÍMBOLOS!



=

SEGURIDAD – Para su protección, lea las advertencias importantes de seguridad incluidas en las instrucciones del producto. Esas advertencias están identificadas con este símbolo.



=

PARE – Por favor lea todas las notas importantes incluidas en las instrucciones del producto para asegurarse que realiza una instalación segura o para obtener la información apropiada. Estas notas están identificadas con este símbolo.

¡NO FORZARLO!

Debido a los cambios imprevistos en los diseños de los vehículos, es posible que cierto material sugerido se instale de manera diferente en su coche que en nuestros vehículos de prueba. Aunque hemos llevado a cabo una profunda investigación para estar seguros de sugerir los mejores portaequipajes y accesorios de Yakima para su vehículo, no nos hacemos responsables de la instalación del producto en el vehículo ni quedamos obligados por todo daño que resultara de las fijaciones, instalación o uso. No intente “adaptarlo por la fuerza” a un vehículo. La responsabilidad del fabricante se limita a reembolsar el precio de compra de la mercancía que presente fallas de materiales o defectos de fabricación.

COSAS QUE SE DEBEN HACER Y OTRAS QUE NO

SE DEBE HACER

- ☒ Respetar las instrucciones y las advertencias detalladas de instalación.
- ☒ Amarrar las cargas largas o anchas al extremo delantero y trasero del vehículo. Si le parece que la carga se va a volar por los aires, es posible que lo haga. ¡AMÁRRELA!
- ☒ Verificar siempre que toda fijación, correa, portaequipaje de fábrica o todo otro elemento que se pueda aflojar esté bien apretado y seguro. Esto se debe hacer cada 300 a 500 millas, o si estuvo conduciendo en caminos desparejos, con temperaturas extremas o con mucho viento.
- ☒ Utilizar solamente accesorios de Yakima, según lo previsto.

NO SE DEBE HACER

- ☐ No transportar objetos que tengan una forma irregular o que sean inestables, como muebles, colchones, ni ninguna otra carga que no se pueda amarrar con total seguridad.
- ☐ No cortar ni modificar el portaequipaje ni los accesorios de montaje.
- ☐ No exceder los límites de peso de los fabricantes de vehículos.
- ☐ No sobrecargar los accesorios ni el portaequipaje.
- ☐ No conducir con el portaequipaje cargado fuera de las rutas.



ATENCIÓN: CERCÍOARSE DE QUE TODO EL EQUIPO ESTÁ ASEGURADO SEGÚN LAS INSTRUCCIONES. LAS PIEZAS DE MONTAJE PUEDEN AFLOJARSE CON EL TIEMPO. VERIFIQUE ANTES DE CADA USO Y AJUSTE SI ES NECESARIO.

MANTENIMIENTO: Para los tornillos utilice un lubricante no soluble en agua. Para limpiar las piezas de plástico, emplee un paño blando con agua y detergente suave.

QUITE LOS ACCESORIOS ANTES DE ENTRAR EN UN LAVADERO AUTOMÁTICO DE VEHÍCULOS.

SI NECESITA ASISTENCIA TÉCNICA O REPUESTOS

Contacte un vendedor, visite el sitio www.yakima.com o llame al (888)925-4621

De lunes a viernes,
7:00 AM a 5:00 PM, hora del Pacífico

ADVERTENCIA IMPORTANTE

ES FUNDAMENTAL QUE TODOS LOS PORTAEQUIPAJES Y ACCESORIOS YAKIMA ESTÉN FIJADOS DE MANERA CORRECTA Y SEGURA AL VEHÍCULO. UNA INSTALACIÓN DEFICIENTE PODRÍA CAUSAR UN ACCIDENTE DE AUTOMÓVIL PROVOCANDO HERIDAS GRAVES O, INCLUSO, SU MUERTE O LA DE TERCEROS. USTED ES RESPONSABLE DE INSTALAR DE MANERA SEGURA LOS PORTAEQUIPAJES Y ACCESORIOS AL VEHÍCULO, DE VERIFICAR LA SOLIDEZ DE LAS FIJACIONES ANTES DE PARTIR Y DE INSPECCIONAR PERIÓDICAMENTE EL AJUSTE DE LOS PRODUCTOS, ASÍ COMO SU DESGASTE Y POSIBLES DAÑOS. POR LO TANTO, USTED DEBE LEER Y COMPRENDER TODAS LAS INSTRUCCIONES Y ADVERTENCIAS QUE VIENEN CON LOS PRODUCTOS YAKIMA ANTES DE INSTALARLOS O USARLOS. SI NO COMPRENDE TODAS LAS INSTRUCCIONES Y ADVERTENCIAS, O SI NO TIENE EXPERIENCIA EN MECÁNICA O NO ESTÁ FAMILIARIZADO CON LOS MÉTODOS DE INSTALACIÓN, HAGA INSTALAR EL PRODUCTO POR UN INSTALADOR PROFESIONAL.



CUENTE CON NUESTRO RESPALDO

Esta garantía limitada a vida cubre todos los productos* y componentes de montaje de marca Yakima, fabricados por Yakima Products, Inc. (Yakima), y es válida durante todo el tiempo que el comprador original conserve el producto. La validez de esta garantía caduca cuando el comprador original vende o transfiere el producto a otra persona.

Sujeto a la inspección de Yakima™ y a las limitaciones y exclusiones descritas en esta garantía, Yakima reparará o reemplazará, a su criterio, el producto que presente defectos de material y/o mano de obra, según lo crea conveniente, y sin costo por las piezas o el trabajo que esto suponga. Yakima puede decidir, según lo estime conveniente, no reparar o reemplazar un producto defectuoso. En tal caso, Yakima™ otorgará al comprador original, a su criterio, ya sea un reembolso igual al precio de compra o un crédito para ser usado en la compra de nuevos productos o componentes de montaje Yakima. Esta garantía no cubre problemas causados por uso o desgaste normal del producto (incluyendo, a modo enunciativo pero no limitativo, rayones, abolladuras, u oxidaciones que afectan sólo la apariencia de las superficies), accidentes, uso ilegal del vehículo, reparaciones o modificaciones no realizadas o autorizadas por Yakima.

Esta garantía no cubre los problemas causados por el uso y desgaste normal del producto (incluyendo, a modo enunciativo pero no limitativo, raspones, abolladuras, rajaduras u oxidaciones que afectan sólo la apariencia de las superficies, o la degradación natural de los colores y materiales con el tiempo y el uso prolongado), uso comercial, accidentes, uso indebido del vehículo, reparaciones o modificaciones no realizadas o no autorizadas por Yakima.

Si el comprador original considera que un producto tiene algún defecto, puede comunicarse con el concesionario de productos Yakima donde adquirió el producto, quien le entregará las instrucciones necesarias sobre cómo proceder en este caso. Si no es posible comunicarse con el concesionario, o éste no puede reparar el defecto, el comprador original deberá comunicarse con Yakima por correo electrónico, escribiendo a yakwarranty@yakima.com o llamando al 888 925 4621 para recibir las instrucciones de envío del producto.

Al comunicarse directamente con Yakima, un técnico de Yakima entregará las instrucciones apropiadas al comprador original para devolver el producto a Yakima. El comprador original se debe hacer cargo de los gastos de envío. Para recibir un servicio de reparación cubierto por esta garantía (tanto del concesionario de los productos Yakima como directamente de Yakima) se exigirá sin excepción el original de la factura o del recibo. La garantía Lifetime se aplica a todos los productos fabricados después del 1 de enero de 2006.

LIMITACIÓN DE LA RESPONSABILIDAD

BAJO LOS TÉRMINOS DE ESTA GARANTÍA, LA COMPENSACIÓN OFRECIDA AL COMPRADOR ORIGINAL SE LIMITA A LA REPARACIÓN O REEMPLAZO DE UN PRODUCTO DEFECTUOSO O AL OTORGAMIENTO DE UN REEMBOLSO O CRÉDITO (SEGÚN LO DETERMINE YAKIMA). ESTA GARANTÍA NO CUBRE LOS DAÑOS O LESIONES QUE PUDIERAN SUFRIR EL COMPRADOR ORIGINAL, SU VEHÍCULO, LA CARGA O BIENES Y/O TODA OTRA PERSONA O BIEN.

ESTA GARANTÍA REEMPLAZA EXPRESAMENTE A TODA OTRA GARANTÍA ESTABLECIDA DE MANERA ORAL O ESCRITA.

LA RESPONSABILIDAD DE YAKIMA™ SE LIMITA A LA COMPENSACIÓN INDICADA MÁS ARRIBA. EN NINGÚN CASO, YAKIMA SERÁ RESPONSABLE DE DAÑOS DIRECTOS, INDIRECTOS, RESULTANTES, INCIDENTALES, PARTICULARES, EJEMPLARES O PUNITIVOS O DE DAÑOS DE TODA OTRA NATURALEZA (INCLUYENDO, A MODO ENUNCIATIVO PERO NO LIMITATIVO, LA PÉRDIDA DE GANANCIAS O VENTAS).

CIERTOS ESTADOS NO PERMITEN LA EXCLUSIÓN O LIMITACIÓN POR DAÑOS INCIDENTALES O INDIRECTOS. DE SER ASÍ, LO DESCRITO ANTERIORMENTE SOBRE LA LIMITACIÓN DE LA GARANTÍA NO SE APLICA A SU CASO.

ESTA GARANTÍA LE OTORGA DERECHOS LEGALES ESPECÍFICOS Y USTED PODRÍA TAMBIÉN GOZAR DE OTROS DERECHOS QUE VARÍAN DE UN ESTADO A OTRO.

Contacte a Yakima escribiendo a yakwarranty@yakima.com o llamando al (888) 925-4621.

Jeff Clarke

From: Jeff Parker [jeff@kvheli.com]

Sent: November 28, 2013 4:50 PM

To: Jeff Clarke

Subject: Re: Bike Racks

Hey Jeff!

That is awesome you guys are still working on the bike rack system. a small basket for packs would be good but normally mountain bikers, especially downhill riders don't carry too much stuff. Just a small camelback usually and a helmet (gloves and goggles stuffed inside helmet). Even with a basket on, I usually have them hold their helmets on their laps because they are usually quite expensive and I don't want them to get all scratched and beat up.

With bike racks on, I would prefer to land. Hover exits aren't 100% legal unless the air carrier is doing aerial work and unfortunately mountain bikers don't really fall under this category. If we had a trail that didn't have a heli pad I would try and land the riders as close as possible and then just sling the bikes in. Most trail heads have a pad.

Wendell and I were talking about the basket again just the other day. He is away for a week or two but I'll sit down with him again when he is back. What is the delivery looking like for the XL basket right now?

Thanks! Let me know if there is anything else I can do for the bike rack program.

Jeff Parker
Kootenay Valley Helicopters Ltd
89 Lakeside Drive, Nelson
British Columbia, V1L 6B9
Ph. (250) 505-2150
FAX (250) 505-2154
Email: jeff@kvheli.com

On 2013-11-28, at 4:39 PM, Jeff Clarke wrote:

Hi Jeff,

I think we have made some good progress on the bike rack, we picked up a Yakima High Roller, very nice system they have.

We are considering a small basket for carrying packs to go with it, possibly as part of the supporting structure underneath, which would open on the side instead of top, maybe 10" tall x 22" deep x 56" or 75" long (depending on how the rack ends up). Would this be useful for you? How much "stuff" do the bikers usually take with them? We are assuming a water pouch and a day pack per person, but were wondering if there would be much else.

We have also been talking about the operation. Would you expect to be in a situation where you

28/11/2013

have one skid in contact with the ground and unload that side, or would you normally land (possibly shutdown?) and unload in a clearing?

I also have a note that said you may be looking for another basket in December, just checking if that is still in the works?

Regards,
Jeff

From: Jeff Parker [mailto:jeff@kvheli.com]
Sent: October 21, 2013 11:25 AM
To: Jeff Clarke
Subject: Re: Bike Racks

Yeah the Alstrom rack looks like junk. If you can use something to wedge the tire into, it will accommodate different tire sizes and keep it tight. Chairlift bike racks are kind of like that.

Jeff Parker
Kootenay Valley Helicopters Ltd
89 Lakeside Drive, Nelson
British Columbia, V1L 6B9
Ph. (250) 505-2150
FAX (250) 505-2154
Email: jeff@kvheli.com

On 2013-10-21, at 10:56 AM, Jeff Clarke wrote:

Ya I was just looking at that one over the weekend. Our main concern is if the system is too adjustable how to make it fool-proof, because it has to grab right every time without question. Also we will likely need to fabricate our own parts so we can properly demonstrate compliance for the aircraft regs, and I expect the loads to be higher than they may have been designed for on a car, so we are looking at something that is not too complex.

I have seen some pictures of the Alstrom rack, it looks a little hokey from what I can see.

Will keep you updated.
Jeff

From: Jeff Parker [mailto:jeff@kvheli.com]
Sent: October 21, 2013 10:45 AM
To: Jeff Clarke
Subject: Re: Bike Racks

Also, check out Yakima high roller.

Jeff Parker
Kootenay Valley Helicopters Ltd
89 Lakeside Drive, Nelson
British Columbia, V1L 6B9
Ph. (250) 505-2150
FAX (250) 505-2154
Email: jeff@kvheli.com

On 2013-10-21, at 10:24 AM, Jeff Clarke wrote:

Hi Jeff,

We have been looking at AS350 bike racks for a while here, we have a concept just about in place that will grab on the lower tube of the frame. We just noticed the other day that lots of the higher end bikes don't have round frame tubes. Do you have any experience with what your customers bikes look like?

Thanks,

Jeff Clarke, CET

AERO Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Phone: 604.483.AERO (2376)
Fax: 604.483.2372



WARNING: BE SURE ALL HARDWARE IS SECURED ACCORDING TO INSTRUCTIONS. ATTACHMENT HARDWARE CAN LOOSEN OVER TIME. CHECK BEFORE EACH USE, AND TIGHTEN IF NECESSARY.

MAINTENANCE: Use non-water soluble lubricant on screws. Use a soft cloth with water and mild detergent to clean plastic parts.

REMOVE ACCESSORY BEFORE ENTERING AN AUTOMATIC CAR WASH.

**TECHNICAL ASSISTANCE
OR REPLACEMENT PARTS**

Contact your dealer, or visit
www.yakima.com, or call
(888)925-4621

Monday through Friday,
7:00 AM to 5:00 PM, PST

IMPORTANT WARNING

IT IS CRITICAL THAT ALL YAKIMA RACKS AND ACCESSORIES BE PROPERLY AND SECURELY ATTACHED TO YOUR VEHICLE. IMPROPER ATTACHMENT COULD RESULT IN AN AUTOMOBILE ACCIDENT, AND COULD CAUSE SERIOUS BODILY INJURY OR DEATH TO YOU OR TO OTHERS. YOU ARE RESPONSIBLE FOR SECURING THE RACKS AND ACCESSORIES TO YOUR CAR, CHECKING THE ATTACHMENTS PRIOR TO USE, AND PERIODICALLY INSPECTING THE PRODUCTS FOR ADJUSTMENT, WEAR, AND DAMAGE. THEREFORE, YOU MUST READ AND UNDERSTAND ALL OF THE INSTRUCTIONS AND CAUTIONS SUPPLIED WITH YOUR YAKIMA PRODUCT PRIOR TO INSTALLATION OR USE. IF YOU DO NOT UNDERSTAND ALL OF THE INSTRUCTIONS AND CAUTIONS, OR IF YOU HAVE NO MECHANICAL EXPERIENCE AND ARE NOT THOROUGHLY FAMILIAR WITH THE INSTALLATION PROCEDURES, YOU SHOULD HAVE THE PRODUCT INSTALLED BY A PROFESSIONAL INSTALLER SUCH AS A QUALIFIED GARAGE OR AUTO BODY SHOP.



WE GOT YOUR BACK

This limited lifetime warranty covers all Yakima-brand products* and rack components manufactured by Yakima Products, Inc. (Yakima), and is effective for as long as the original retail purchaser owns the product. This warranty terminates when the original retail purchaser sells or otherwise transfers the product to any other person.

Subject to Yakima's inspection of the product, Yakima will remedy defects in materials and/or workmanship by repairing or replacing, at Yakima's option, the defective product

without charge for parts or labor, subject to the limitations and exclusions described in this warranty. Yakima may elect, at its option, not to repair or replace a defective product, in which case Yakima will issue to the original retail purchaser, at Yakima's option, either a refund equal to the purchase price paid for the product, or a credit to be used toward the purchase of new Yakima products or rack components.

This warranty does not cover problems caused by normal wear and tear (including, but not limited to, scratches, dents, tears, or aesthetic oxidation of surfaces, or natural breakdown of colors and materials over extended time and use), commercial use, accidents, unlawful vehicle operation, or modifications or repairs not performed or authorized by Yakima.

In addition, this warranty does not cover problems resulting from conditions beyond Yakima's control including, but not limited to, theft, misuse, overloading, or failure to assemble, mount or use the product in accordance with Yakima's written instructions or guidelines included with the product or made available to the original retail purchaser.

If a product is believed to be defective, the original retail purchaser should contact the Yakima dealer from whom it purchased the product, who will give the original retail purchaser instructions on how to proceed. If the original retail purchaser is unable to contact the Yakima dealer, or the dealer is not able to remedy the defect, the original retail purchaser should contact Yakima by e-mail at: yakwarranty@yakima.com, or phone 888.925.4621 for shipping instructions.

Upon contacting Yakima directly, a Yakima technician will provide the original retail purchaser with appropriate instructions for returning the product to Yakima. The original retail purchaser will be responsible for the cost of mailing the product to Yakima. In order to receive any remedy under this warranty (either from a Yakima dealer, or from Yakima directly), proof of purchase in the form of an original purchase invoice or receipt is strictly required. Lifetime warranty applies to all products manufactured after January 1, 2006.

LIMITATION OF LIABILITY

REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT, OR THE ISSUANCE OF A REFUND OR CREDIT (AS DETERMINED BY YAKIMA), IS THE ORIGINAL RETAIL PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY. DAMAGE OR INJURY TO THE ORIGINAL RETAIL PURCHASER, TO HIS OR HER VEHICLE, CARGO, OR PROPERTY, AND/OR TO ANY OTHER PERSON OR PROPERTY IS NOT COVERED BY THIS WARRANTY. THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ANY AND ALL OTHER EXPRESS WARRANTIES, WHETHER ORAL OR WRITTEN.

YAKIMA'S SOLE LIABILITY IS LIMITED TO THE REMEDY SET FORTH ABOVE. IN NO EVENT WILL YAKIMA BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES OR FOR ANY OTHER DAMAGES OF ANY KIND OR NATURE (INCLUDING, BUT NOT LIMITED TO, LOST PROFITS OR LOST SALES).

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

You contact Yakima by e-mail at: yakwarranty@yakima.com, or phone (888) 925-4621

YAKIMA

READ ME FIRST!

FOR YOUR SAFETY

Register your new product Warranty Registration Online: www.yakima.com
Change the Future! Free Swag + Sweet Gear, go to www.yakima.com/research



FIRST OFF, THANKS!

Welcome to the Yakima family. We appreciate your support and are confident that you'll get years of solid performance from your new Yakima product. Below are a few helpful hints to make sure that you have a great ownership experience.

WATCH FOR THESE SYMBOLS!



=

SAFETY – Keep safe by reading the important safety warnings included in the product instructions! Safety warnings are identified with this symbol.



=





STOP – Please read all important product notes in the product instructions to ensure proper installation or fit information. These notes are identified with this symbol.

DON'T FORCE IT!






Due to unforeseen variations in vehicle designs, some of the suggested hardware may fit differently on your car than our test vehicles. Although we have conducted extensive research to confidently suggest the best Yakima racks and accessories for your vehicle, Yakima is not responsible for rack-to-vehicle installation, nor are we liable for any damages resulting from attachment, installation, or use. Do not attempt to "force fit" a vehicle. The liability of the manufacturer is limited to the purchase price of the merchandise that proves defective in materials and/or workmanship.

SOME DO'S AND DON'TS

DO

-  Follow the detailed installation instructions and warnings.
-  Tie down long or wide loads at the front and rear of the load. If it looks like it can catch some air, it will. **TIE IT DOWN!**
-  Always check that any hardware, straps, factory racks, or anything that can come loose is tight and secure. This should be done after every 300 - 500 miles or if you were in rough road conditions, severe temperatures, or winds.
-  Only use Yakima accessories as intended.

DON'T

-  Do not carry odd shaped or unstable objects such as furniture, mattresses, or any other objects that can not be securely tied down.
-  Do not cut or modify the rack or mounting accessories.
-  Do not exceed the vehicle manufacturers weight limits.
-  Do not overload any accessory or rack.
-  Do not use your rack off road.

Kootenay Valley

Helicopter Biking → Seen ^{Alstrom} ~~Attach~~ (Nardigg)
LSIC

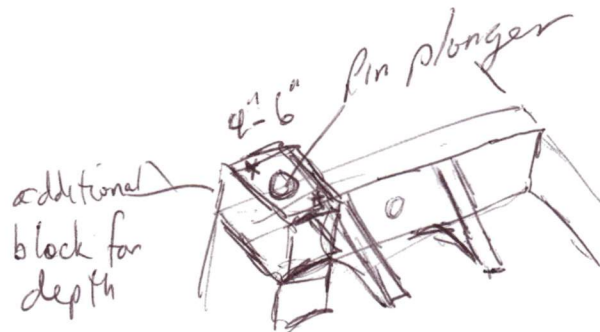
Sling Bikes, then take people
bikes on chair lift

would flight test

Maybe basket in
December

Bottom Plate

Same as LIDAR (834?)

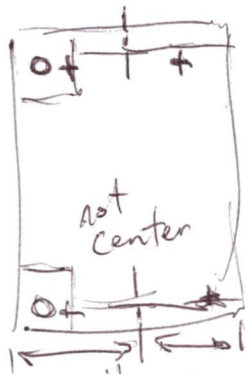


Pin $\phi 3/4$

DRAG
→



snk stud fitting in to
reduce gap to $1/16$ "



position so when
flipped brace moves

use $1" \times 0.065$ SQR ~~430~~ S/S
tracks $22\frac{1}{2}$ → + use existing jig??

Middle?

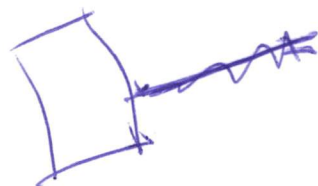


$$22\frac{1}{2} - 4 = 18\frac{1}{2} / 3 = 6\frac{1}{6}$$

$$22 - 4 = 18 / 3 = 6$$

try to arrange so will work
w/ med or long baskets / steps

outside plates fixed, only middle
moves.



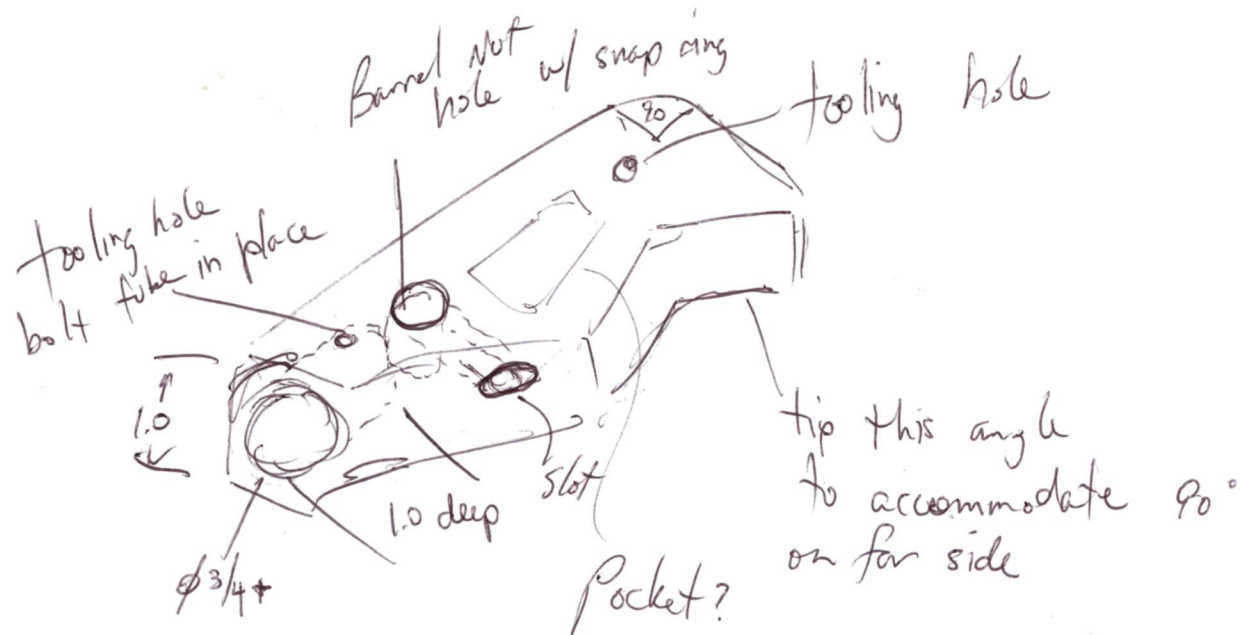
0
2



a

o

Cripper



machine profile from top

flip for corner round

Stand up for hole in end

lie flat for slot

[Vertical Hitch Racks](#) [Platform Hitch Racks](#) [Two Arm Hitch Racks](#) [Single Arm Hitch Racks](#)

[Up Racks](#) Platform racks are designed to transport all shapes and styles of bikes. We offer 2 or 4 bike models, as well as towing and RV approved models.

G10 – 64681 NEW NOW AVAILABLE

[Racks](#)

Fit
Item #
Max. Load
Up To 2 Bikes
Fits 1-1/4" and 2" Hitch Receiver
63450
45 lbs. per bike

[Jackknife 2 Bike](#)
[Jackknife 4 Bike](#)
[View All...](#)

Jackknife 4
Carries
Fit
Item #
Max. Load
Up to 4 Bikes
2" Hitch Receiver
63460
45 lbs. per Bike

G10
Carries
Fit
Item #
Max. Load
Up to 2 bikes
1-1/4" and 2" Hitch Receiver
64681
45 lbs. per bike

[G10](#)
[Quad 2+2](#)
[Semi 4.0](#)
[Semi 2.0](#)
[TRAVELER XCS 2](#)
[Traveler XC 2](#)
[View All...](#)

Quad 2+2
Carries
Fit
Item #
Max. Load
up to 4 bikes
2" Hitch Receiver
64691
45 lbs. per bike

Semi 4.0
Carries
Fit
Item #
Max. Load
up to 4 bikes
2" Hitch Receiver
64695 New
45 lbs. per bike

Semi 2.0
Carries
Fit
Item #
Max. Load
Up to 2 bikes
1-1/4" and 2" Hitch Receiver
64685





45 lbs. per bike

**TRAVELER XCS 2**

Carries
Fit
Item #
Max. Load
Up to 2 Bikes
2" Towing Receiver
64664
35 lbs per Bike

**TRAVELER XC 2**

Carries
Fit
Item #
Max. Load
Up to 2 Bikes
2" Hitch Receiver or 2" Bumper Mount
64663
35 lbs per Bike

**TRAILHEAD FOUR**

Carries
Fit
Item #
Max. Load
Up to 4 Bikes
Fold-down 1-1/4" and 2" Hitch Receiver
63380
35 lbs per Bike

**TRAILHEAD THREE**

Carries
Fit
Item #
Max. Load
Up to 3 Bikes
Fold-down 1-1/4" and 2" Hitch Receiver
63365
35 lbs per Bike

[TRAILHEAD FOUR](#)
[TRAILHEAD THREE](#)
[TRAILHEAD TWO](#)
[TITAN FOUR](#)
[TITAN THREE](#)
[TITAN TWO](#)
[View All...](#)

**TRAILHEAD TWO**

Carries
Fit
Item #
Max. Load
Up to 2 Bikes
Fold-down 1-1/4" and 2" Hitch Receiver
63360
35 lbs per Bike

**TITAN FOUR**

Carries
Fit
Item #
Max. Load
Up to 4 Bikes
Fold-down 1-1/4" and 2" Hitch Receiver
63410
35 lbs per Bike

**TITAN THREE**

Carries
Fit
Item #
Max. Load
Up to 3 Bikes
Fold-down 1-1/4" and 2" Hitch Receiver

ANTHEM ADVANCED 27.5

READY TO LEAVE THE COMPETITION IN THE DUST? THIS NEW 27.5 ROCKETSHIP IS THE CHOICE OF GIANT PROS FOR TECHNICAL XC TERRAIN.



SPECIFICATIONS

FRAME	
SIZES	XS, S, M, L, XL
COLOURS	Matte Composite/Gloss Black/Gloss Charcoal
FRAME	Advanced-grade composite w/ALUXX SL rear triangle, 4" Maestro suspension
FORK	Fox 32 Float CTD Performance, w/15mm thru-axle, OverDrive 2 steerer, 100mm travel
SHOCK	Fox Float CTD Performance
COMPONENTS	
HANDLEBAR	Giant Contact Trail, low rise, 31.8mm
STEM	Giant Contact, OverDrive 2
SEATPOST	Giant Contact, 30.9mm
SADDLE	Fi'zi:k Tundra 2, MG rails
PEDALS	N/A
DRIVETRAIN	
SHIFTERS	Shimano Deore XT, Rapid Fire
FRONT DERAILLEUR	Shimano Deore XT
REAR DERAILLEUR	Shimano Deore XT, Shadow Plus
BRAKES	Shimano Deore XT, hydraulic disc, 160mm
BRAKE LEVERS	Shimano Deore XT
CASSETTE	Shimano HG81 11x36, 10-speed
CHAIN	KMC X10 SL
CRANKSET	Shimano Deore XT, 26/38
BOTTOM BRACKET	Shimano Press Fit
WHEELS	
RIMS	Giant P-XCR1 WheelSystem
HUBS	Giant P-XCR1 WheelSystem, [F] 15mm axle, [R] 142x12mm axle
SPOKES	Giant P-XCR1 WheelSystem
TIRES	Schwalbe Racing Ralph Evo, tubeless ready, 27x2.25, folding

FRAME DESIGN

Engineered to give Giant's elite-level racers every advantage on technical XC racecourses, this all-new bike features the race-proven performance of the Anthem name-smooth Maestro Suspension, confident handling and lightweight frame technology-but supercharged with a new purpose-built 27.5-inch-wheel frame design. Handcrafted with a superlight and stiff Advanced Composite mainframe and meticulously engineered geometry, optimized for a 100mm suspension fork, it's the ultimate XC speed machine. Frame technologies include Giant's OverDrive 2 steerer tube for precision stiffness and steering, internal cable routing, and dropper seat cable routing.

Advanced
COMPOSITE TECHNOLOGY

MAESTRO
SUSPENSION

OVERDRIVE2

KEY UPGRADES

KEY UPGRADES (OVER ANTHEM ADVANCED 27.5 2)

- Fox 32 Float CTD Performance with 15mm thru-axle, OverDrive 2 steerer suspension fork
- Fox Float CTD Performance rear shock
- Shimano Deore XT componentry
- Giant P-XCR1 27.5 WheelSystem, tubeless compatible, 1655 grams
- Sizes: XS, S, M, L, XL
- Color: Matte Composite/Gloss Black/Gloss Charcoal

Suggested Retail Price (CDN): \$ 4,299

FRAME GEOMETRY

Size	Part number	B: Head Angle	C: Seat Angle	D: Toptube	E: Headtube	F: Chainstay	G: Wheelbase	H: Standover Height
Inches		Degree	Degree	Inches	Inches	Inches	Inches	Inches
XS/14.5	N/A	69.5	74.0	21.9	3.7	17.0	42.1	28.0
S/16	N/A	69.5	73.0	22.6	3.7	17.0	42.5	28.1
M/18	N/A	69.5	73.0	23.4	3.9	17.0	43.3	29.3
L/20	N/A	69.5	73.0	24.2	3.9	17.0	44.1	30.8
XL/22	N/A	69.5	73.0	25.0	4.3	17.0	44.9	31.7

LUST ADVANCED 2

SPARK A SINGLETRACK LOVE AFFAIR. STEEP CLIMBS, DARING DESCENTS. QUICK, AGILE, SUPER CONFIDENT. THIS IS THE ANSWER.



SPECIFICATIONS

FRAME	
SIZES	XS, S, M
COLOURS	Composite/Berry/Light Blue
FRAME	Advanced-grade composite w/ALUXX SL rear triangle, 4" Maestro suspension
FORK	Fox 32 Float CTD Evolution, w/15mm thru-axle, OverDrive 2 steerer, 100mm travel
SHOCK	Fox Float CTD Evolution
COMPONENTS	
HANDLEBAR	Giant Connect SL, low rise, 31.8mm
STEM	Giant Connect SL, OverDrive 2
SEATPOST	Giant Connect, 30.9mm
SADDLE	Liv/giant Contact, Forward
PEDALS	N/A
DRIVETRAIN	
SHIFTERS	Shimano SLX, Rapid Fire
FRONT DERAILLEUR	SRAM X7
REAR DERAILLEUR	Shimano Deore XT, Shadow Plus
BRAKES	Shimano SLX, hydraulic disc, 160mm
BRAKE LEVERS	Shimano SLX
CASSETTE	Shimano HG81 11x35, 10-speed
CHAIN	KMC X10 SL
CRANKSET	SRAM S1000, 22/36
BOTTOM BRACKET	SRAM Press Fit
WHEELS	
RIMS	Giant P-XC2, double wall
HUBS	Giant Performance Tracker sealed bearing, [F] 15mm axle, [R] 142x12mm axle
SPOKES	Stainless Steel, 14/15g
TIRES	Schwalbe Racing Ralph Evo, tubeless ready, 27.5x2.25, folding

FRAME DESIGN

The world's first women's-specific carbon fiber full-suspension bike with the new 27.5-inch wheel size gives you the upper hand on technical XC terrain. The combination of Advanced-grade composite frame material and Maestro Suspension makes it equally capable in all-out race efforts or all-day trail epics. Liv/giant's women's geometry is optimized for 27.5-inch wheels, making it perfectly balanced for women trail riders. And the technologies-including an OverDrive 2 steerer tube and 15mm front thru-axle for stiffness and steering precision, MegaDrive downtube and PowerCore bottom bracket-lead it a fast yet stable feel on any XC terrain.



KEY UPGRADES

- Fox 32 Float CTD Evolution with 15mm thru-axle, OverDrive 2 steerer suspension fork
 - Fox Float CTD Evolution rear shock
 - Shimano XT/SLX 10-speed components with Shimano SLX disc brakes
 - Giant P-XC2 27.5 double wall rim, Giant Performance Tracker sealed bearing hub, 14/15 gauge butted spokes wheelset
 - Sizes: XS, S, M
 - Color: Composite/Berry/Light Blue
- Suggested Retail Price (CDN): \$ 3,199

FRAME GEOMETRY

Size	Part number	B: Head Angle	C: Seat Angle	D: Toptube	E: Headtube	F: Chainstay	G: Wheelbase	H: Standover Height
Inches		Degree	Degree	Inches	Inches	Inches	Inches	Inches
XS/14.5	N/A	70.0	73.0	21.7	3.7	17.0	41.5	25.7
S/16	N/A	70.0	73.0	22.4	3.9	17.0	42.1	26.9
M/18	N/A	70.0	73.0	23.2	4.3	17.0	42.9	28.3
L/20	N/A	70.0	73.0	23.6	4.7	17.0	43.3	29.6